Fire Fighting Training Unit - Site #4

SITE HEALTH AND SAFETY PLAN (SHASP)

Navy Public Works Center (PWC) Cognizant Tasks

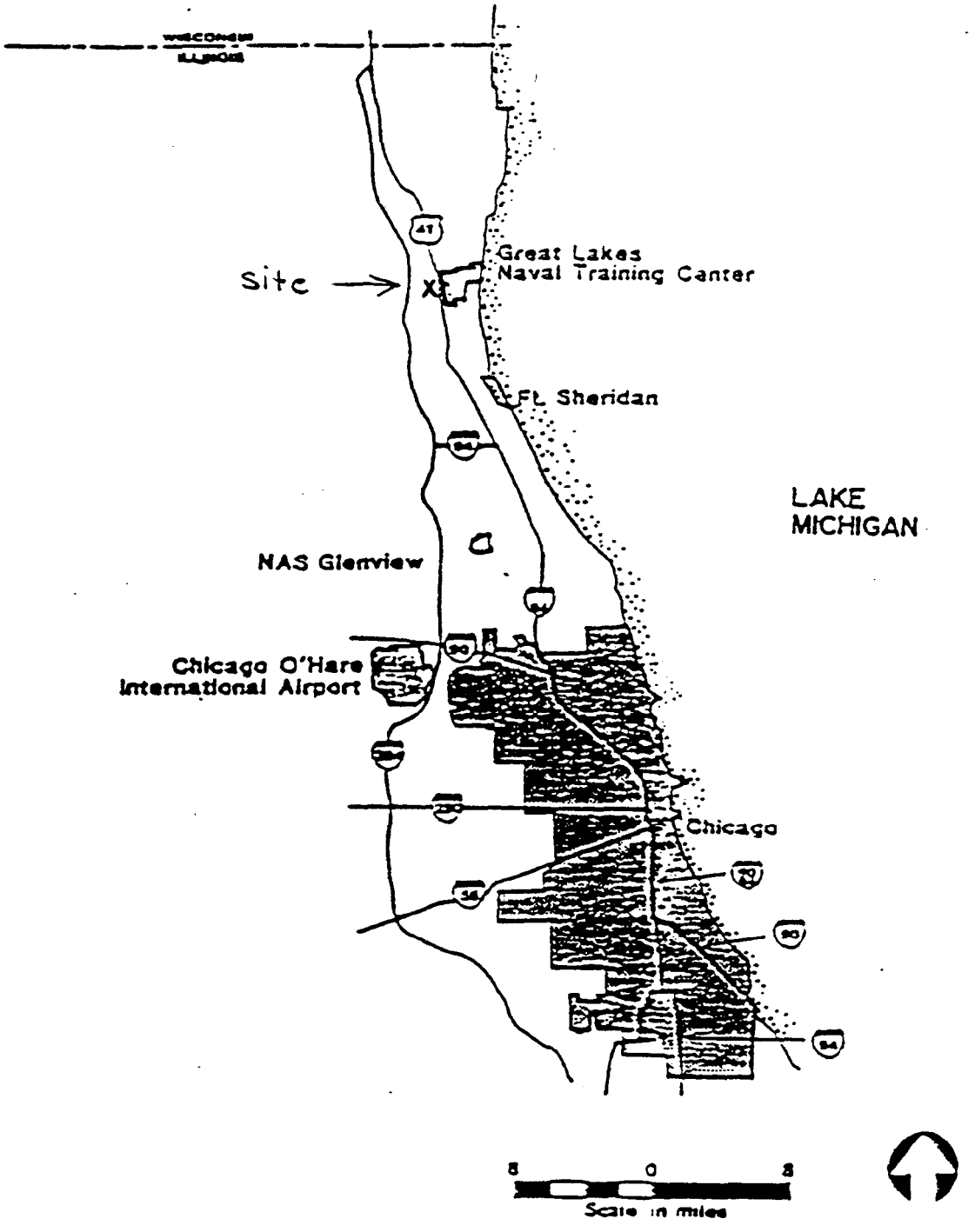
Demolition of Auxiliary Structures
and
Removal of Buried Fuel and Water Piping

In Cooperation With:
Beling Consultants
Contract No. N68950-95-D-9021

Prepared By:
Naval Training Center - Great Lakes
Environmental Department - Code 900
2703 Sheridan Road, Suite 120, Building 1A
Great Lakes, Illinois 60088

November 1996

TABLE OF CONTENTS

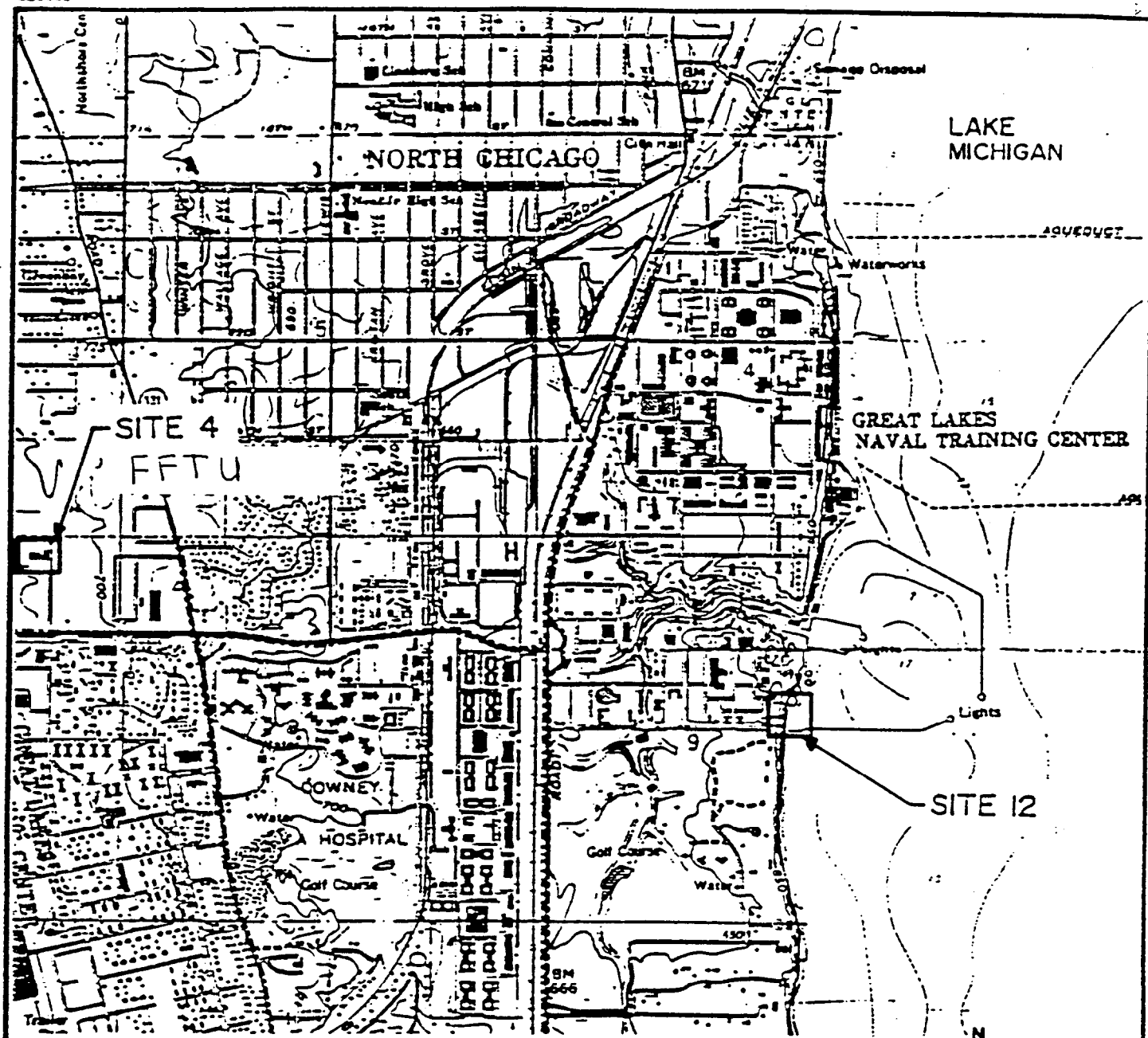


SOURCE:
INITIAL ASSESSMENT STUDY
ROGERS, GOLDEN, HALPERN, 1986

SEC DONOHUE
Environment & Infrastructure

FIGURE I-1
GENERAL LOCATION MAP

NAVAL TRAINING CENTER
GREAT LAKES, ILLINOIS



SOURCE:
USGS 7.5 MINUTE QUADRANGLE
WAUKEGAN, ILLINOIS 1960
PHOTOREVISED 1972 AND 1980

SEC DONOHUE
Environment & Infrastructure

FIGURE 1-2
SITE LOCATION MAP

NAVAL TRAINING CENTER
GREAT LAKES, ILLINOIS

1. INTRODUCTION

This Site Health and Safety Plan (SHASP) is submitted in support of remedial actions to be carried out at the Fire Fighting Training Unit (FFTU), Great Lakes Naval Training Center, Great Lakes, Illinois. The FFTU has been designated as a CERCLA site and requires restoration. Both Illinois and Federal environmental regulations are applicable. The Navy is obligated to restore the site to residential environmental standards.

The primary objective of this effort is to remove all buried piping and tanks, demolish above ground structures, conduct a remedial investigation, prepare a remedial design, and conduct site restoration.

As part of this effort the Navy Public Works Center (PWC) - Great Lakes (GL) has been tasked with the following items, shown in order of occurrence:

1. Removal and Disposal of Aboveground Metal Structures
2. Removal and Disposal of Gravel, Asphalt and Concrete
3. Trenching of Underground Piping (oil/gas/water distribution)
4. Removal and Disposal of Underground Oil/Gas Distribution Piping
5. Backfill of Bioremediation Mixture

2. SITE DESCRIPTION

a. Location

The Fire Fighting Training Unit (FFTU), is located about 0.5 miles northeast of the intersection of U.S. 41 and Buckley Road. The FFTU is approximately 10-acres, partially paved and surrounded on all sides by the Willow Glen Golf Course. The FFTU was in operation between 1942 and October 1990.

b. Hazards

The following is a list chemicals and compounds that are found on-site in various areas. Chemical Data Sheets and/or Hazard Guidelines for each compound listed below, providing information such as the chemicals characteristics, health hazards, protection, exposure limits, and first aid procedures are presented in Appendix I. Provided in Appendix II are the field sampling results from Beling consultants for potential on-site health and safety stressors. These chemicals and compounds include:

- **Petroleum (Diesel and Gasoline) Products** *(Oil/Gas Distribution Ppg, Drain Ppg, Oil/Water Separator Ppg and Sumps)*
  - xylene, toluene, napthalene, 1,2,4-trimethlylbenzene, 1,3,5-trimethlylbenzene, methylene chloride, PNA's
- **Herbicides** *(Drain Ppg, Oil/Water Separator Ppg and Sumps)*
  - 2,4-D, Silvex, 2,4-DB
- **Lubricants** *(Drain Ppg)*
  - 1,2,4-trichlorobenzene, 1,2,4-trimethlylbenzene
- **Pesticides** *(Drain Ppg, Oil/Water Separator Ppg and Sumps)*
  - 4,4-DDD, Beta-BHC, 4,4-DDE, Heptachlor, Dieldrin, Gamma Chlordane, Aldrin, 1,2-dibromo-3-chloropropane, dibenzofuran, lindane
- **Metals** *(Oil/Gas Distribution Ppg, Drain Ppg, Oil/Water Separator Ppg and Sumps)*
  - Barium, Cadmium, Chromium, Thallidium, Iron, Manganese, Zinc
- **Fire Extinguishing Agents** *(Drain Ppg, Oil/Water Separator Ppg and Sumps)*
  - tricloroflоromethane, ethyl glycol

NOTE: PCB's were not detected in any of the samples.

c. Area Affected

The former Fire Fighting Training Unit (FFTU), located about 0.5 miles northeast of the intersection of U.S. 41 and Buckley Road. The FFTU is approximately 10-acres, partially paved and surrounded on all sides by the Willow Glen Golf Course.

d. Adjacent Population

Willow Glen Golf Course, Golf Course Workers and Contractors

e. Topography

Outdoors. Flat asphalt and gravel surface.

f. Weather

All activities will be conducted outdoors at the FFTU. Weather conditions for the FFTU will be updated on-site.

3. ENTRY OBJECTIVES

The objective of the initial entry to the contaminated area is to (describe actions, tasks to be accomplished; i.e., identify contaminated soil; monitor conditions, etc.)

Navy Public Works Center - Great Lakes has been tasked overall with the following items:

1. Removal and Disposal of Aboveground Metal Structures
2. Removal and Disposal of Gravel, Asphalt and Concrete
3. Trenching of Underground Piping (oil/gas/water distribution)
4. Removal and Disposal of Underground Oil/Gas Distribution Piping
5. Backfill of Bioremediation Mixture

4. ON-SITE ORGANIZATION AND COORDINATION

The following personnel are designated to carry out the stated job functions on site. All personnel arriving or departing the site should log in and out with the Recordkeeper. All activities on site must be cleared through the Project Team Leader.

Project Team Leaders	J.P. Messier, Code 918 Terry Aide, Code 917
Site Safety Officer	Bob Walleck, Code 09K2
Site Industrial Hygienist	Jim Walker, Naval Hospital - IH
Site Safety Observers	Ed Bickle, NTC Luigi Abbate, Code 914LA Norman Lucas, Code 914NL J.P. Messier, Code 918 Terry Aide, Code 917
Public Information Officers	J.P. Messier, Code 918 Terry Aide, Code 917
Security Officers	Ed Bickle, NTC Luigi Abbate, Code 914LA Norman Lucas, Code 914NL
Recordkeepers	J.P. Messier, Code 918 Terry Aide, Code 917
Field Team Leaders	J.P. Messier, Code 918 Terry Aide, Code 917
Field Team Members	Ed Bickle, NTC Luigi Abbate, Code 914LA Norman Lucas, Code 914NL
Federal Agency Reps	Laura Ripley, USEPA
State Agency Reps	Don Harisson, IEPA
Local Agency Reps	Not Applicable
Contractor	Beling Consultants

5. ON-SITE CONTROL

- ***Ed Bickle, NTC*** has been designated to coordinate access control and security on site. A safe perimeter has been established at:

    * See attached Site Map - Appendix III

- ***No un-authorized person*** should be within this area.

- The ***On-Site Command Post*** and staging area have been established at

    * To be determined on-site

- Control boundaries have been established, and the ***Exclusion Zone***, and ***Support Zone*** (clean area) have been identified and designated as follows: (describe boundaries and/or attach map of controlled area).

    * See attached Site Map - Appendix IV

- These boundaries are identified by (marking of zones, i.e., red boundary tape - hotline; traffic cones support zone, etc.)

    * ***Exclusion Zones*** are identified by ***Red Tape***, ***Support Zones*** are identified by ***Yellow Tape***.

6. HAZARD EVALUATION

The following is a list chemicals and compounds that are found on-site in various areas. Chemical Data Sheets and/or Hazard Guidelines for each compound listed below, providing information such as the chemicals characteristics, health hazards, protection, exposure limits, and first aid procedures are presented in Appendix I. Provided in Appendix II are the field sampling results from Beling consultants for potential on-site health and safety stressors. These chemicals and compounds include:

- **Petroleum (Diesel and Gasoline) Products** *(Oil/Gas Distribution Ppg, Drain Ppg, Oil/Water Separator Ppg and Sumps)*
  * xylene, toluene, napthalene, 1,2,4-trimethlylbenzene, 1,3,5-trimethlylbenzene, methylene chloride, PNA's

- **Herbicides** *(Drain Ppg, Oil/Water Separator Ppg and Sumps)*
  * 2,4-D, Silvex, 2,4-DB

- **Lubricants** *(Drain Ppg)*
  * 1,2,4-trichlorobenzene, 1,2,4-trimethlylbenzene

- **Pesticides** *(Drain Ppg, Oil/Water Separator Ppg and Sumps)*
  * 4,4-DDD, Beta-BHC, 4,4-DDE, Heptachlor, Dieldrin, Gamma Chlordane, Aldrin, 1,2-dibromo-3-chloropropane, dibenzofuran, lindane

- **Metals** *(Oil/Gas Distribution Ppg, Drain Ppg, Oil/Water Separator Ppg and Sumps)*
  * Barium, Cadmium, Chromium, Thallidium, Iron, Manganese, Zinc

- **Fire Extinguishing Agents** *(Drain Ppg, Oil/Water Separator Ppg and Sumps)*
  * tricloroflоromethane, ethyl glycol

NOTE: PCB's were not detected in any of the samples.

The following additional hazards are expected on site:

- Electrical, Moving Machinery, Noise, Eye, and Trip Hazards

7. PERSONAL PROTECTIVE EQUIPMENT

Based on evaluation of potential hazards, the following levels of personal protection have been designated for the applicable work areas or tasks.

Location	Job Functions	Level of Protection
Exclusion Zone	Remove Metal Structures	A B ***C*** ***D*** Other
	Remove Gravel, Asphalt, Concrete	A B ***C*** ***D*** Other
	Trenching of Underground Piping	A B ***C*** ***D*** Other
	Remove Underground Piping	A B ***C*** ***D*** Other
	Backfill Bioremediation Mixture	A B ***C*** ***D*** Other
Contamination Reduction Zone	Decontamination	A B C ***D*** Other

Specific protective equipment for each level of protection is as follows:

Level A

- Not required.

Level B

- Self-contained breathing apparatus (SCBA) plus all those items delineated for Level C

Level C

- Half-face or full-face air purifying respirator with acid gas/organic vapor/HEPA filter cartridges, or as directed by the Site Safety Officer
- Disposable Tyvek coveralls
- Disposable latex inner gloves
- Nitrile outer gloves
- Safety glasses or goggles
- Hard-hat
- Splash guard PPE, as appropriate
- Steel toe, steel shank boots
- Disposable outer boots
- Noise protection

Level D

- Disposable Tyvek coveralls
- Hard-hat
- Safety glasses or goggles
- Steel toe, steel shank boots
- Disposable latex gloves
- Outer neoprene gloves
- Disposable outer boots
- Noise protection

If air-purifying respirators are required, utilize the appropriate canister (as directed by the Site Safety Officer and Industrial Hygienist) for use with the involved substances and concentrations. the Site Safety Officer and Industrial Hygienist has determined that all criteria for using this type of respiratory protection have been met.

NO CHANGE TO THE SPECIFIED LEVELS OF PROTECTION SHALL BE MADE WITHOUT THE APPROVAL OF THE SITE SAFETY OFFICER AND INDUSTRIAL HYGIENIST.

8. ON-SITE WORK PLANS

A work party consisting of 2 - 6 people will perform the following tasks:

Project Team

Leader Name	J.P. Messier, Code 918 Terry Aide, Code 917	Function:	Project Planning Field Oversight Project Coordination Safety Coordination Quality Control
Work Party	J.P. Messier, Code 918		Field Oversight Contractor Liaison
	Terry Aide, Code 917		Field Oversight Contractor Liaison
	Ed Bickle, NTC		Safety Observer Security Officer
	Luigi Abbate, Code 914LA		Safety Observer Security Officer
	Norman Lucas, Code 914NL		Safety Observer Security Officer
	Mr. Beasley, Code 700 Mr. Bolin, Code 700		Equipment Operator Laborer
Rescue Team: (Required for entries to IDLH environments)	Great Lakes Fire Department		Emergency Response
Decontamination Team:	Luigi Abbate, Code 914LA Norman Lucas, Code 914NL		Personnel Decon Equipment Decon Supply Officer

The work party(s) will be briefed on the contents of this plan at the work site.

9. COMMUNICATION PROCEDURES

- As determined on-site, a radio frequency for personnel in the ***Exclusion Zone*** will be designated. All other on-site communications will use normal channels.

- Personnel in the ***Exclusion Zone*** should remain in constant sight of the Project Team Leader.

- The constant blast of an air horn is the emergency signal to indicate that all personnel should leave the ***Exclusion Zone***.

- The following standard hand signals will be used in case of radio failure:

  * Hand gripping throat >>> Out of air, can't breath
  * Grip partner's wrist >>> Leave area immediately
    both hands around waist
  * Hands on top of head >>> Need assistance
  * Thumbs Up >>> OK, I am all right, I understand
  * Thumbs Down >>> No, negative

10. DECONTAMINATION PROCEDURES

All site personnel shall minimize the need for any extensive decontamination procedures. All decon is to take place in the ***Contamination Reduction Zone***. No eating, drinking, or smoking is to occur in the ***Exclusion*** nor in the ***Contamination Reduction Zone***. Anticipated levels of protection for site operations is designated next to the phase of work being accomplished as delineated in the site workplan. A Level C/D means Level C with potential to be downgraded to level D.

Level D Decon

1. Washing boots, waders, or other non-disposable protective equipment (i.e., hard hat, safety glasses/goggles, etc.) suspected of being contaminated using soap solution followed by potable or distalled water rinse.

2. Removal and disposal of coveralls.

3. Removal and disposal of disposable boots.

4. Removal and disposal of gloves.

5. Wash hands and face.

Level C Decon

1. Washing boots, waders, or other non-disposable protective equipment (i.e., hard hat, safety glasses/goggles, etc.) suspected of being contaminated using soap solution followed by potable or distalled water rinse.

2. Removal and disposal of boot covers and waders if worn.

3. Removal and disposal of coveralls.

4. Removal and disposal of gloves.

5. Removal, cleaning, and storage of respiratory equipment.

6. Removal and disposal of inner gloves.

7. Wash hands and face.

A ***Level B*** decon includes all that of Level C with the inclusion of cleaning of the self-contained breathing apparatus (SCBA) in the initial stages.

All equipment (i.e., backhoe, hand tools, etc.) will be decontaminated on-site in an area as designated by the Site Safety Officer and Site Technical Advisor. Decontamination procedures will include a brush and wipe down followed by a scrub with a soap solution and a triple rinse with potable or distilled water.

All decontamination materials and wastes shall be contained and disposed of properly. It is the responsibility of PWC - Great Lakes Safety Office, the Certified Industrial Hygienist, Site Supervisor, Work Leader, and the worker themselves to ensure that all required guidelines and protocol for health and safety are followed.

11. SITE HEALTH and SAFETY OVERVIEW

- The designated ***Site Safety Officer***, Bob Walleck a PWC Great Lakes OSH Specialist and Jim Walker, a Great Lakes Naval Hospital Industrial Hygienist are directly responsible to the Project Team Leader for Safety and Health recommendations on site.

- ***Emergency Medical Care***

  No personnel on-site are trained EMT. Medical assistance can be obtained by calling extension 3333.

- ***Name and Address of Medical Facility***

  Naval Hospital
  Building 200H, NTC
  Great Lakes, Illinois 60088-5600

- ***Phone Number of Facility***

  847-688-5997

- ***Name of Person contacted and time***

  _____

  _____

  _____ a.m. ._____ p.m.

This person was briefed on the situation, the potential hazards, and the substances involved. A map of routes to this facility is available at (usually the Command Post), or at Command Post, the PWC Great Lakes Environmental Office and enclosed in this Plan.

- ***Local ambulance service*** is available from Naval Hospital at phone number X3333. Their response time is less than 5 minutes. Whenever, possible arrangements should be made for on-site standby.

- ***First aid equipment*** is available on site at the following locations:

1. _____

2. _____

- Emergency medical information for ***substances*** present:

  See MSDS section of this plan for specific information

- ***LIST OF EMERGENCY NUMBERS***

Agency/Facility	Phone #	Contact
Police	NTC GLakes X3333	Duty Officer
Fire	NTC GLakes X3333	Duty Officer
Hospital	NTC GLakes X3333	Duty Officer

- ***Environmental Monitoring***

The following environmental monitoring instruments shall be issued on-site (cross out if not applicable) at the specified intervals.

Combustible Gas Indicator	continuous/hourly/daily/other _____
O_2 Monitor	continuous/hourly/daily/other _____
Calorimetric Tubes	continuous/hourly/daily/other _____
Hnu Photoionization Detector (PID)	continuous/hourly/daily/other _____
HUN/OVA	continuous/hourly/daily/other _____
Other _____	continuous/hourly/daily/other _____
_____	continuous/hourly/daily/other _____

- ***Emergency Procedures*** *(should be modified as required for incident)*

The following standard emergency procedures will be used by on-site personnel. The site Safety Officer shall be notified of any On-Site emergencies and be responsible for ensuring that the appropriate procedures are followed.

Personnel Injury in the Exclusion Zone

Upon notification of any injury in the Exclusion Zone, the designated emergency signal blast with air horn shall be sounded. All site personnel shall assemble at the decontamination line. The rescue team will enter the Exclusion Zone (if required) to remove the injured person to the hotline. The Site Safety Officer and Project Team Leader should evaluate the nature of the injury, and the affected person should be decontaminated to the extent possible prior to movement to the Support Zone. The EMT's shall be called to initiate appropriate first aid, and contact should be made for an ambulance and with the designated medical facility (if required). No persons shall re-enter the Exclusion Zone until the cause of the injury of symptoms is determined.

Personnel Injury in the Support Zone

Upon notification of any injury in the Support Zone, the Project Team Leader and Site Safety Office will assess the nature of the injury. If the cause of the injury or loss of the injured person does not affect the performance of site personnel operations may continue with the EMT's being called to initiate the appropriate first aid and necessary follow-up as stated above. If the injury increases the risk to others, the designated emergency signal blast with air horn shall be sounded and all site personnel shall move to the decontamination line for instructions. Activities will stop until the added risk is removed or minimized.

Fire/Explosion

Upon notification of a fire or explosion on site, the designated emergency signal blast with air horn shall be sounded and, all site personnel assembled at the decontamination line. The fire department shall be alerted and all personnel moved to a safe distance from the involved incident.

Personal Protective Equipment Failure

If any site worker experiences a failure or alteration of protective equipment that affects the protection factor, that person and his/her buddy shall immediately leave the Exclusion Zone. Reentry shall not be permitted until the equipment has been repaired or replaced.

Other Equipment Failure

If any other equipment on site fails to operate properly, the Project Team Leader and Site Safety Officer shall be notified and then determine the effect of this failure on continuing operations on site. If the failure affects the Safety of personnel or prevents completion of the Work Plan tasks, all personnel shall leave the exclusion Zone until the situation is evaluated and appropriate actions taken.

- The following ***emergency escape routes*** are designated for use in those situations where egress from the ***Exclusion Zone*** cannot occur through the decontamination line: (describe alternate routes to leave area in emergencies)

  See attached Maps - Appendix III and IV

- In all situations, when an ***on-site emergency*** results in evacuation of the ***Exclusion Zone***, personnel shall not ***re-enter*** until:

  1. The conditions resulting in the emergency have been corrected.
  2. The hazards have been reassessed.
  3. The Site Safety Plan has been reviewed.
  4. Site personnel have been briefed on any changes in the Site Safety Plan.

- ***Personal Monitoring***

Personnel Monitoring will be in effect on-site: Personal exposure sampling: (describe any personal sampling programs being carried out on site personnel. This would include use of sampling pumps,. air monitors, etc.

Personal monitoring requirements for these operations will be determined by the Great lakes Naval Hospital Industrial Hygiene Division together with the Navy Public Works Center Great Lakes Safety Office, and in accordance with OPNAVINST 5100.23D. The required monitoring will also be conducted by the Great Lakes Naval Hospital Industrial hygiene Division.

Medical Monitoring: The expected air temperature will be 35 F to 75 F. If it is determined that heat stress monitoring is required (mandatory if over 85 F) the following procedures shall be followed:
(describe procedures in effect, i.e., monitoring body temperature, body weight, pulse rate).

Additional breaks shall be taken and the Navy Public Works Center Safety Office shall be consulted

12. FAMILIARIZATION CERTIFICATION

All site personnel have read the above plan and are familiar with its provisions.

Site Safety Officer _____

Certified Industrial Hygienist _____

Project Team Leader _____

Other Site Personnel _____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

APPENDIX I

MATERIAL SAFETY DATA SHEETS AND HAZARD GUIDELINES

..PRINT ALL/DOC=1

1

AN ACCESSION NUMBER: 844. 9205.

CN CHEMICAL NAME: DDD.

SY SYNONYMS: NCI-C00475. DICHLORODIPHENYL DICHLOROETHANE. DILENE. RHOTHANE D-3. TDE. ME-1700. ENT 4,225. ETHANE, 1,1-DICHLORO-2,2-BIS(P-CHLOROPHENYL)-. 1,1-BIS(P-CHLOROPHENYL)-2,2-DICHLOROETHANE. 1,1-BIS(4-CHLOROPHENYL)-2,2-DICHLOROETHANE. 2,2-BIS(P-CHLOROPHENYL)-1,1-DICHLOROETHANE. 2,2-BIS(4-CHLOROPHENYL)-1,1-DICHLOROETHANE. 1,1-DICHLORO-2,2-BIS(P-CHLOROPHENYL)ETHANE. 1,1-DICHLORO-2,2-BIS(PARACHLOROPHENYL)ETHANE. 1,1-DICHLORO-2,2-BIS(4-CHLOROPHENYL)ETHANE. P,P'-DICHLORODIPHENYLDICHLOROETHANE. RHOTHANE. ROTHANE. P,P'-TDE. RCRA U060.

RN CAS NUMBER: 72-54-8.

REG. TOXIC NUMBER: KI0700000.

CHEMICAL FORMULA: C14H10CL4.

PD

PHYSICAL DESCRIPTION:
COLORLESS CRYSTALS.

MOL WT:	320.1
BOILING PT:	DECOMPOSES
SOLUBILITY:	INSOLUBLE
FLASH PT:	150 F
VAPOR PRES:	N/A
MELT PT:	228 F
UEL IN AIR:	COMBUSTIBLE
LEL IN AIR:	COMBUSTIBLE
MEC IN AIR:	
SPEC GRAVITY:	1.476 AT 68 F
VAPOR DENSITY:	
ODOR THRESHOLD:	
OCTANOL/WATER CO-EFFICIENT:.	

EL

PERMISSABLE EXPOSURE:
NONE ESTABLISHED
PROBABLE HUMAN CARCINOGEN (EPA - CATEGORY B)
INDEFINITE CARCINOGEN IN RATS (NCI)
NEGATIVE CARCINOGEN IN MICE (NCI)
MUTAGENIC DATA (RTEC)
CERCLA HAZARD RATINGS - TOXICITY 2 - IGNITABILITY 0 - REACTIVITY 0 - PERSISTENCE 3
CROP TOLERANCES (40CFR180.187) PPM - APPLES 7, APRICOTS 7, BEANS 7, BLACKBERRIES 3.5, BLUEBERRIES 7, BOYSENBERRIES 3.5, BROCCOLI 1, BRUSSEL SPROUTS 1, CABBAGE 1, CARROTS 1, CAULIFLOWER 1, CHERRIES 3.5, PEAS 1

OSHA STANDARD 1910.1200 HAZARD COMMUNICATION REQUIRES CHEMICAL MANUFACTURERS AND IMPORTERS TO ASSESS THE HAZARDS OF CHEMICALS WHICH THEY PRODUCE OR IMPORT, AND ALL EMPLOYERS TO PROVIDE INFORMATION TO THEIR EMPLOYEES CONCERNING HAZARDOUS CHEMICALS BY MEANS OF A HAZARD COMMUNICATION PROGRAM, LABELS AND OTHER FORMS OF WARNING, MATERIAL SAFETY DATA SHEETS, AND INFORMATION AND TRAINING. REQUIRES DISTRIBUTORS TO TRANSMIT REQUIRED INFORMATION TO EMPLOYEES.

DANGEROUS EXPOSURE:
NONE SPECIFIED
COLORLESS CRYSTALS.

INCOMPATIBILITIES:
STRONG ALKALIES. PEROXIDES.

CL

CLOTHING:
NO NIOSH/OSHA DATA; RECOMMEND
PREVENT REPEATED OR PROLONGED SKIN CONTACT
WEAR IMPERVIOUS CLOTHING
WEAR GLOVES
WEAR FACESHIELD (8 INCH MINIMUM)
PLACE CONTAMINATED CLOTHING IN CLOSED CONTAINERS FOR STORAGE UNTIL LAUNDERED OR DISCARDED
IF CLOTHING IS TO BE LAUNDERED, INFORM PERSON PERFORMING OPERATION OF CONTAMINANT'S HAZARDOUS PROPERTIES
-ACGIH 'GUIDELINES FOR THE SELECTION OF CHEMICAL PROTECTIVE CLOTHING' INDICATED THE FOLLOWING PROTECTIVE RATINGS FOR MATERIALS COMMONLY USED FOR PROTECTIVE CLOTHING. THESE RATINGS ARE BASED PRIMARILY ON QUANTITATIVE TEST RESULTS AND QUALITATIVE RESISTANCE INFORMATION. (THE RECOMMENDATIONS APPLY TO THE PURE SUBSTANCE ONLY; BREAKTHROUGH-TIME MAY VARY FOR MIXTURES.) (A '+' DESIGNATES A BLEND OF MATERIALS, WHILE A '/' DESIGNATES A COATED OR LAMINATED MATERIAL.) -
POLYNUCLEAR AROMATIC HALOGEN COMPOUNDS: EXCELLENT/GOOD: POLYVINYL ALCOHOL FAIR/POOR: NATURAL RUBBER POLYVINYL CHLORIDE A WIDE VARIATION IN RATINGS IS INDICATED FOR THE FOLLOWING MATERIALS: BUTYL RUBBER NEOPRENE NEOPRENE/NATURAL RUBBER.

WEAR EYE PROTECTION TO PREVENT:
NO OSHA STANDARD, NIOSH CRITERIA DOCUMENT ADVISES:
WEAR FACE SHIELD OR VENTED GOGGLES.

EMPLOYEE SHOULD WASH:
NO OSHA STANDARD, NIOSH CRITERIA DOCUMENT ADVISES:
PROMPTLY WHEN SKIN BECOMES CONTAMINATED AND AT END OF EACH WORK SHIFT
SHOWER AT END OF EACH SHIFT.

WORK CLOTHING SHOULD BE CHANGED DAILY:
NO OSHA STANDARD, NIOSH CRITERIA DOCUMENT ADVISES:
IF THERE IS ANY POSSIBILITY THAT CLOTHING MAY BE CONTAMINATED
LEAVE CLOTHING & EQUIPMENT FOR DECONTAMINATION & DISPOSAL.

REMOVE CLOTHING:
NO OSHA STANDARD, NIOSH CRITERIA DOCUMENT ADVISES:
PROMPTLY IF IT IS NON-IMPERVIOUS AND CONTAMINATED
SHOWER AFTER EACH SHIFT PRIOR TO LEAVING PREMISES.

THE FOLLOWING EQUIPMENT SHOULD BE AVAILABLE:
NO OSHA STANDARD, NIOSH CRITERIA DOCUMENT ADVISES:
EYE-WASH FOUNTAIN WITHIN IMMEDIATE WORK AREA WHERE EMPLOYEES' EYES MAY BE EXPOSED TO SUBSTANCE QUICK DRENCHING FACILITIES WITHIN IMMEDIATE WORK AREA WHERE EMPLOYEES MAY BE EXPOSED TO SUBSTANCE.

RP

RESPIRATOR SELECTION (UPPER LIMIT DEVICES PERMITTED):
NO SPEC ADVISE:
- CHEMICAL CARTRIDGE RESPIRATOR
WITH AN ORGANIC VAPOR CARTRIDGE

HIGH LEVELS:
- DUST, MIST AND FUME RESPIRATOR
INCLUDING PESTICIDE RESPIRATORS
WITH HALF-MASK

FIREFIGHTING:
- SELF-CONTAINED BREATHING APPARATUS
WITH A FULL FACE-PIECE
OPERATED IN PRESSURE-DEMAND OR POSITIVE-PRESSURE MODE.

MC

NO OSHA STANDARD, NIOSH CRITERIA DOCUMENT ADVISES: GENERAL MEDICAL HISTORY.
40CFR717 RECORDS AND REPORTS OF ALLEGATIONS THAT CHEMICAL SUBSTANCES CAUSE SIGNIFICANT ADVERSE REACTIONS TO HEALTH OR THE ENVIRONMENT TOXIC SUBSTANCES CONTROL ACT (TSCA) SECTION 8(C) RULE REQUIRES MANUFACTURERS AND CERTAIN PROCESSORS OF CHEMICAL SUBSTANCES AND MIXTURES TO KEEP RECORDS OF SIGNIFICANT ADVERSE REACTIONS TO EMPLOYEE HEALTH FOR 30 YEARS.
PHYSICIAN PRE-PLACEMENT AND ANNUAL EXAMS.
CENTRAL NERVOUS SYSTEM TESTS, PERIPHERAL NEUROPATHY.
BLOOD CHEMISTRY.
COMPLETE BLOOD COUNT.
PULMONARY FUNCTIONS.
RESPIRATORY HISTORY.
URINALYSIS.
VISION TEST.
PRE-EMPLOYMENT ERYTHROCYTE CHOLINESTERASE, TWO TESTS TO DETERMINE MEAN NORMAL LEVEL; TEST MUST NOT DIFFER BY MORE THAN 15%.
ATTENTION TO SMOKING, ALCOHOL, MEDICATION, AND EXPOSURE TO CARCINOGENS.
29CFR1910.20 OSHA STANDARD SUBPART C - GENERAL SAFETY AND HEALTH PROVISIONS PROVIDES FOR EMPLOYEE, DESIGNATED REPRESENTATIVE, AND OSHA ACCESS TO EMPLOYER-MAINTAINED EXPOSURE AND MEDICAL RECORDS RELEVANT TO EMPLOYEES EXPOSED TO TOXIC SUBSTANCES AND HARMFUL PHYSICAL AGENTS.
53FR38140 9/29/88 (AMENDED).

RE

ROUTE OF ENTRY:
INHALATION. INGESTION. SKIN ABSORPTION.

TO

TARGET ORGANS:
SKIN. LUNGS. RESPIRATORY SYSTEM. MUCOUS MEMBRANES. LIVER. CHOLINESTERASE. CENTRAL NERVOUS SYSTEM.

SP

SYMPTOMS:
SKIN, COVERING OF BODY (SC0174);
IRRITATION, EXTREME REACTION TO A CONDITION (SC0090).
CENTRAL NERVOUS SYSTEM, PERTAINING TO NEURAL BODY SYSTEM (SC0028);
DEPRESSION, DECREASE IN ACTIVITY/FUNCTION (SC0043). HEADACHE, PAIN IN HEAD OR CRANIUM AREA (SC0075). NAUSEA, SICKNESS AT THE STOMACH (SC0115).
MUSCULAR, ORGAN RESPONSIBLE FOR MOTION (SC0110);
SPASM, CONVULSIVE MUSCULAR CONTRACTION (SC0153). VOMITING, PERTAINING TO NAUSEA (SC0166). ABDOMINAL CRAMPS, PAINFUL SPASMS OF ABDOMINAL AREA (SC0218). WEAKNESS, LACK OF STRENGTH (SC0167). DROOLING/FROTHING OF MOUTH & NOSE, EXCESS SALIVA FROM MOUTH, NOSE (SC0277). VISUAL DISTURBANCE, UPSET IN SIGHT (SC0165). COMATOSE, STATE OF DEEP UNCONSCIOUSNESS (SC0186). RESPIRATORY DISTRESS, DIFFICULTY BREATHING (SC0219). LACRIMATION, DISCHARGE OF TEARS (SC0096). DYSPNEA, DIFFICULTY IN BREATHING (SC0052). SWEATING, EXCRETING MOISTURE THROUGH THE SKIN (SC0156). NERVOUSNESS, STATE OF UNREST, UNEASINESS (SC0118).
CONVULSIONS, SUDDEN MUSCLE CONTRACTIONS (SC0034).
HEPATIC, PERTAINING TO THE LIVER (SC0081);
NEOPLASM, ABNORMAL TISSUE FORMATION (SC0272).
RESPIRATORY, PERTAINING TO THE LUNGS (SC0142);
NEOPLASM, ABNORMAL TISSUE FORMATION (SC0272). LIVER DAMAGE, INJURY TO THE LIVER (SC0221). CHLORACNE, REDDISH DERMATOLOGICAL CONDITION (SC0276). EMACIATION, MALNUTRITION (SC0299). WEIGHT LOSS, DROP IN BODY WEIGHT (SC0104). FASCICULATION, TWITCHING OF GROUPS OF MUSCLE FIBERS (SC0063). DYSPNEA, DIFFICULTY IN BREATHING (SC0052). TREMORS, TREMBLING, SHAKING (SC0197). LASSITUDE, A SENSE OF WEARINESS (SC0098). MALAISE, UNEASINESS, DISCOMFORT, FEELING BAD (SC0106).
CHOLINESTERASE, ENZYME FOR NERVE CELL SIGNALS (SC0025);
INHIBITION, REPRESSION OF FUNCTION (SC0387).

FA

FIRST AID.

AMOUNTS OF WATER OR NORMAL SALINE, OCCASIONALLY LIFTING UPPER AND LOWER LIDS, UNTIL NO EVIDENCE OF CHEMICAL REMAINS (APPROXIMATELY 15-20 MINUTES). GET MEDICAL ATTENTION IMMEDIATELY.

(2 OF 4)
IF THIS CHEMICAL GETS ON THE SKIN, REMOVE CONTAMINATED CLOTHING AND SHOES IMMEDIATELY. WASH AFFECTED AREA WITH SOAP OR MILD DETERGENT AND LARGE AMOUNTS OF WATER UNTIL NO EVIDENCE OF CHEMICAL REMAINS (APPROXIMATELY 15-20 MINUTES). GET MEDICAL ATTENTION IMMEDIATELY.

(3 OF 4)
IF THIS CHEMICAL HAS BEEN INHALED, REMOVE FROM EXPOSURE AREA TO FRESH AIR IMMEDIATELY. IF BREATHING HAS STOPPED, PERFORM ARTIFICIAL RESPIRATION. KEEP PERSON WARM AND AT REST. TREAT SYMPTOMATICALLY AND SUPPORTIVELY. GET MEDICAL ATTENTION IMMEDIATELY.

(4 OF 4)
HALOGENATED PESTICIDE INGESTION: REMOVE INGESTED PESTICIDE BY IPECAC EMESIS OR GIVE ACTIVATED CHARCOAL FOLLOWED BY GASTRIC LAVAGE WITH 2-4 LITERS OF TAP WATER. FOLLOW WITH A SALINE CATHARTIC. DO NOT GIVE FATS OR OILS. INTESTINAL LAVAGE WITH 20% MANNITOL (200 ML) BY STOMACH TUBE IS ALSO USEFUL. MAINTAIN RESPIRATION, GIVE OXYGEN IF RESPIRATION IS DEPRESSED. GET MEDICAL ATTENTION IMMEDIATELY. GENERAL MEASURES: GIVE DIAZEPAM, 10 MG VERY SLOWLY AS AN ANTICONVULSANT. IF CONVULSIONS PERSIST, USE A NEUROMUSCULAR BLOCKING AGENT AND CONTROLLED RESPIRATION. FOR HYPERACTIVITY OR TREMORS, GIVE PHENOBARBITAL SODIUM, 100 MG SUBCUTANEOUSLY HOURLY UNTIL CONVULSIONS ARE CONTROLLED O UNTIL 0.5 G HAS BEEN GIVEN. DO NOT GIVE STIMULANTS. ALL PROCEDURES MUST BE PERFORMED BY QUALIFIED MEDICAL PERSONNEL ONLY. (DREISBACH, HANDBOOK OF POISONING, 12TH ED.).

DT
SPECIAL DIAGNOSTIC TESTS AND INDEXES OF EXPOSURE:
TRUE ACETYLCHOLINESTERASE.
PSEUDO OR BUTYRYLCHOLINESTERASE.

RS
REGULATORY STATUS.
COMMUNICATION REQUIRES CHEMICAL
MANUFAC
ENTER DOCUMENT SELECTION._:

END OF DOCUMENTS IN LIST_:
BRS SEARCH MODE - ENTER QUERY
3_: ..OFF

*CONNECT TIME 0:04:13 HH:MM:SS 0.070 DEC HRS SESSION 159
*SIGN OFF 8:55:19 06/10/92708 154B DISCONNECTED 00 40 00:00:04:31

@

GET MEDICAL ATTENTION IMMEDIATELY.

6

AN ACCESSION NUMBER: 822. 9112.
CN CHEMICAL NAME: DDT.
SY SYNONYMS: NCI-C00464. ENT 1,506. ESTONATE.
DICHLORODIPHENYLTRICHLOROETHANE. PENTECH. SANTOBANE. GENITOX. NA 2761. ETHANE, 1,1,1-TRICHLORO-2,2-BIS(P-CHLOROPHENYL)-. BENZENE, 1,1'-(2,2,2-TRICHLOROETHYLIDENE)BIS(4-CHLORO-.
1,1-BIS(P-CHLOROPHENYL)-2,2,2-TRICHLOROETHANE.
2,2-BIS(P-CHLOROPHENYL)-1,1,1-TRICHLOROETHANE.

P,P'-DICHLORODIPHENYLTRICHLOROETHANE.
4,4'-DICHLORODIPHENYLTRICHLOROETHANE.
TRICHLOROBIS(4-CHLOROPHENYL)ETHANE.
1,1,1-TRICHLORO-2,2-BIS(P-CHLOROPHENYL)ETHANE. AGRITAN. AZOTOX. CITOX.
RCRA U061.

RN CAS NUMBER: 50-29-3.

REG. TOXIC NUMBER: KJ3325000.

CHEMICAL FORMULA: C14H9CL5.

PD
PHYSICAL DESCRIPTION:
TASTELESS, ALMOST ODORLESS, WHITE CRYSTALLINE POWDER.

MOL WT:	354.49
BOILING PT:	500 F (260C)
SOLUBILITY:	ALMOST INSOLUBLE
FLASH PT:	N/A
VAPOR PRES:	NEGLIGIBLE
MELT PT:	225-228 F (107-109C)
UEL IN AIR:	
LEL IN AIR:	
MEC IN AIR:	300 F
SPEC GRAVITY:	1.56 @ 15 C
VAPOR DENSITY:	
ODOR THRESHOLD:	
OCTANOL/WATER CO-EFFICIENT:	6.19.

EL
PERMISSABLE EXPOSURE:
1 MG/M3 OSHA TWA (SKIN NOTATION)
1 MG/M3 ACGIH TWA
NIOSH RECOMMENDED LOWEST DETECTABLE LIMIT (0.5 MG/M3 TWA)
HUMAN INADEQUATE EVIDENCE FOR CARCINOGENICITY (IARC GROUP-2B)
ANIMAL SUFFICIENT EVIDENCE FOR CARCINOGENICITY (IARC GROUP-2B)
ANTICIPATED HUMAN CARCINOGEN (NTP)
PROBABLE HUMAN CARCINOGEN (EPA - CATEGORY B)
TUMORIGENIC DATA (RTECS)
REPRODUCTIVE EFFECTS DATA (RTECS); MUTAGENIC DATA (RTECS)
ACCEPTABLE DAILY INTAKE (WHO/FAO): 0.01 MG/KG
AQUATIC TOXICITY RATING 4 (TLM96 <1 MG/L)
CERCLA HAZARD RATINGS - TOXICITY 3 - IGNITABILITY 1 - REACTIVITY 0 - PERSISTENCE 3
TOXICOLOGY: DDT IS TOXIC BY INGESTION AND SKIN ABSORPTION. IT IS A CONVULSANT. POISONING MAY AFFECT THE PERIPHERAL NERVOUS SYSTEM AND LIVER. ORAL ADMINISTRATION TO MICE PRODUCED BENIGN AND MAIGNANT LIVER NEOPLASMS AND LYMPHOMAS AND LUNG NEOPLASMS. ORAL ADMINISTRATION TO RATS CAUSED LIVER NEOPLASMS. EFFECTS OF POISONING MAY BE DELAYED SEVERAL HOURS AND ARE CHARACTERIZED BY PARESTHESIAS OF THE TONGUE, LIPS AND FACE, FOLLOWED BY A SENSE OF APPREHENSION, MALAISE AND HYPEREXCITABILITY. CONVULSIONS MAY ALTERNATE WITH PERIODS OF COMA AND PARTIAL PARALYSIS.
THE THRESHOLD LIMIT VALUE WAS ESTABLISHED TO PREVENT ACUTE POISONING BY A LARGE MARGIN OF SAFETY TO PREVENT SIGNIFICANT ACCUMULATION IN BODY STORES.
PERSONS WITH DISEASES OF THE NERVOUS SYSTEM, LIVER OR BLOOD MAY BE AT AN INCREASED RISK FROM EXPOSURE.
ORGANIC SOLVENTS MAY DECREASE THE CONVULSIVE EFFECTS OF DDT AND INCREASE THE TOXICITY. DDT MAY CAUSE THE PLACENTA AND BE EXCRETED IN

BREAST MILK.
ORL-HMN LDLO: 500 MG/KG ORL-INF LDLO: 150 MG/KG
ORL-HMN TDLO: 5 MG/KG ORL-MSN TDLO: 6 MG/KG
ORL-HMN TDLO: 16 MG/KG ORL-RAT LD50: 87 MG/KG
ORL-MUS LD50: 135 MG/KG SKN-RBT LD50: 300 MG/KG
SKN-RAT LD50: 1931 MG/KG SCU-RAT LD50: 1500 MG/KG
INV-RAT LD50: 68 MG/KG IPR-RAT LD50: 9100 UG/KG

OSHA STANDARD 1910.1200 HAZARD COMMUNICATION REQUIRES CHEMICAL MANUFACTURERS AND IMPORTERS TO ASSESS THE HAZARDS OF CHEMICALS WHICH THEY PRODUCE OR IMPORT, AND ALL EMPLOYERS TO PROVIDE INFORMATION TO THEIR EMPLOYEES CONCERNING HAZARDOUS CHEMICALS BY MEANS OF A HAZARD COMMUNICATION PROGRAM, LABELS AND OTHER FORMS OF WARNING, MATERIAL SAFETY DATA SHEETS, AND INFORMATION AND TRAINING. REQUIRES DISTRIBUTORS TO TRANSMIT REQUIRED INFORMATION TO EMPLOYEES.

DANGEROUS EXPOSURE:
POTENTIAL CARCINOGENNIOSH
TASTELESS, ALMOST ODORLESS, WH.

IC

INCOMPATIBILITIES:
DDT: ALKALIES: MAY CAUSE DECOMPOSITION ALKALOID NICOTINE: MAY CAUSE DECOMPOSITION ALUMINUM SALTS: INCOMPATIBLE BORDEAU MIXTURE: MAY CAUSE DECOMPOSITION CLAY: MAY CAUSE DECOMPOSITION DOLOMITE: MAY CAUSE DECOMPOSITION FERBAM: MAY CAUSE DECOMPOSITION IRON: INCOMPATIBLE OXIDIZERS (STRONG): MAY CAUSE FIRE AND EXPLOSION HAZARD.

CL

CLOTHING:
FOLLOWING INFORMATION FROM NIOSH/OSHA "OCCUPATIONAL HEALTH GUIDELINES FOR CHEMICAL HAZARDS":
EMPLOYERS SHALL PROVIDE AND ENSURE THAT EMPLOYEES USE APPROPRIATE PROTECTIVE CLOTHING AND EQUIPMENT NECESSARY TO PREVENT REPEATED OR PROLONGED SKIN CONTACT WITH THIS SUBSTANCE. FACE SHIELDS SHALL COMPLY WITH 29CFR1910.133(A)(2), (A)(4), (A)(5), AND (A)(6).
EMPLOYERS SHALL ENSURE THAT CLOTHING WHICH HAS HAD ANY POSSIBILITY OF BEING CONTAMINATED WITH THIS SUBSTANCE IS PLACED IN CLOSED CONTAINERS FOR STORAGE UNTIL IT CAN BE DISCARDED OR UNTIL THE EMPLOYER PROVIDES FOR THE REMOVAL OF THE CONTAMINANT FROM THE CLOTHING. IF THE CLOTHING IS TO BE LAUNDERED OR OTHERWISE CLEANED TO REMOVE THE CONTAMINANT, THE EMPLOYER SHALL INFORM THE PERSON PERFORMING THE OPERATION OF THE HAZARDOUS PROPERTIES OF THE SUBSTANCE.

WEAR EYE PROTECTION TO PREVENT:
FOLLOWING INFORMATION FROM NIOSH/OSHA "OCCUPATIONAL HEALTH GUIDELINES FOR CHEMICAL HAZARDS":
EMPLOYERS SHALL PROVIDE AND ENSURE THAT EMPLOYEES USE DUST-RESISTANT SAFETY GOGGLES WHICH COMPLY WITH 29CFR1910.133(A)(2)-(A)(6) WHERE THIS SOLID MAY CONTACT THE EYES.

EMPLOYEE SHOULD WASH:
FOLLOWING INFORMATION FROM NIOSH/OSHA "OCCUPATIONAL HEALTH GUIDELINES FOR CHEMICAL HAZARDS":
EMPLOYERS SHALL ENSURE THAT EMPLOYEES WHOSE SKIN BECOMES CONTAMINATED WITH THIS SUBSTANCE PROMPTLY WASH OR SHOWER WITH SOAP OR MILD DETERGENT AND WATER TO REMOVE ANY CONTAMINANT FROM THE SKIN.
EMPLOYERS SHALL ENSURE THAT ALL EMPLOYEES SUBJECT TO SKIN CONTACT WITH THIS SUBSTANCE WASH WITH SOAP OR MILD DETERGENT AND WATER ANY AREAS OF THE BODY WHICH MAY HAVE CONTACTED THE SUBSTANCE AT THE END OF EACH WORK

DAY.
EMPLOYERS SHALL ENSURE THAT EMPLOYEES WHO HANDLE THIS SUBSTANCE WASH THEIR HANDS THOROUGHLY WITH SOAP OR MILD DETERGENT AND WATER BEFORE EATING OR SMOKING.

WORK CLOTHING SHOULD BE CHANGED DAILY:
FOLLOWING INFORMATION FROM NIOSH/OSHA "OCCUPATIONAL HEALTH GUIDELINES FOR CHEMICAL HAZARDS":
EMPLOYERS SHALL ENSURE THAT EMPLOYEES WHOSE CLOTHING MAY HAVE BECOME CONTAMINATED WITH THIS SUBSTANCE CHANGE INTO UNCONTAMINATED CLOTHING BEFORE LEAVING THE WORK PREMISES.

REMOVE CLOTHING:
FOLLOWING INFORMATION FROM NIOSH/OSHA "OCCUPATIONAL HEALTH GUIDELINES FOR CHEMICAL HAZARDS":
EMPLOYERS SHALL ENSURE THAT NON-IMPERVIOUS CLOTHING WHICH BECOMES CONTAMINATED WITH THIS SUBSTANCE BE REMOVED PROMPTLY AND NOT REWORN UNTIL THE SUBSTANCE IS REMOVED FROM THE CLOTHING.

THE FOLLOWING EQUIPMENT SHOULD BE AVAILABLE:
FOLLOWING INFORMATION FROM NIOSH/OSHA "OCCUPATIONAL HEALTH GUIDELINES FOR CHEMICAL HAZARDS":
EMPLOYERS SHALL ENSURE THAT EMPLOYEES DO NOT EAT OR SMOKE IN AREAS WHERE THIS SUBSTANCE IS HANDLED, PROCESSED OR STORED.

RP

RESPIRATOR SELECTION (UPPER LIMIT DEVICES PERMITTED):
ANY DETECTABLE CONC
- SELF-CONTAINED BREATHING APPARATUS WITH A FULL FACE-PIECE OPERATED IN PRESSURE-DEMAND OR POSITIVE-PRESSURE MODE
- SUPPLIED-AIR RESPIRATOR WITH A FULL FACEPIECE OPERATED IN PRESSURE-DEMAND OR OTHER POSITIVE PRESSURE MODE WITH AUXILIARY SELF-CONTAINED BREATHING APPARATUS OPERATED IN POSITIVE PRESSURE MODE

ESCAPE
- AIR-PURIFYING FULL FACEPIECE RESPIRATOR (GAS MASK) WITH A CHIN-STYLE OR FRONTOR BACK-MOUNTED ORGANIC VAPOR CANISTER HAVING A HIGH EFFICIENCY PARTICULATE FILTER
- APPROPRIATE ESCAPE-TYPE SELF-CONTAINED BREATHING APPARATUS

FIREFIGHTING
- SELF-CONTAINED BREATHING APPARATUS WITH A FULL FACE-PIECE OPERATED IN PRESSURE-DEMAND OR POSITIVE-PRESSURE MODE.

S

MEDICAL SURVEILLANCE:
GENERAL MEDICAL HISTORY.
EKG RECOMMENDED IF EMPLOYEE TO WEAR FULL-FACE RESPIRATOR.
40CFR717 RECORDS AND REPORTS OF ALLEGATIONS THAT CHEMICAL SUBSTANCES CAUSE SIGNIFICANT ADVERSE REACTIONS TO HEALTH OR THE ENVIRONMENT TOXIC SUBSTANCES CONTROL ACT (TSCA) SECTION 8(C) RULE REQUIRES MANUFACTURERS AND CERTAIN PROCESSORS OF CHEMICAL SUBSTANCES AND MIXTURES TO KEEP RECORDS OF SIGNIFICANT ADVERSE REACTIONS TO EMPLOYEE HEALTH FOR 30 YEARS.
PHYSICIAN PRE-PLACEMENT AND ANNUAL EXAMS.
MEDICAL WARNING FOR REFUSAL OF MEDICAL EXAMINATION.
EYE DISEASE.
SKIN EXAM.
LIVER FUNCTION.
REPRODUCTIVE ORGANS EXAMINATION.

CENTRAL NERVOUS SYSTEM TESTS, PERIPHERAL NEUROPATHY.
KIDNEY FUNCTION.
FOOD AND AGRICULTURE ORGANIZATION/WORLD HEALTH ORGANIZATION (FAO/WHO) ACCEPTABLE DAILY INTAKE ESTABLISHED.
29CFR1910.20 OSHA STANDARD SUBPART C - GENERAL SAFETY AND HEALTH PROVISIONS PROVIDES FOR EMPLOYEE, DESIGNATED REPRESENTATIVE, AND OSHA ACCESS TO EMPLOYER-MAINTAINED EXPOSURE AND MEDICAL RECORDS RELEVANT TO EMPLOYEES EXPOSED TO TOXIC SUBSTANCES AND HARMFUL PHYSICAL AGENTS.
53FR38140 9/29/88 (AMENDED).

RE

ROUTE OF ENTRY:
INHALATION. SKIN ABSORPTION. INGESTION. SKIN OR EYE CONTACT.

TO

TARGET ORGANS:
CENTRAL NERVOUS SYSTEM. KIDNEYS. LIVER. SKIN. PERIPHERAL NERVOUS SYSTEM.

SP

SYMPTOMS:
MUCOUS MEMBRANE, MEMBRANE LINING PASSAGES/CAVITIES (SC0109);
IRRITATION, EXTREME REACTION TO A CONDITION (SC0090).
EYE, ORGAN OF SIGHT (SC0170);
IRRITATION, EXTREME REACTION TO A CONDITION (SC0090). PARESTHESIA, ABNORMAL SENSATION WITHOUT CAUSE (SC0125). TREMORS, TREMBLING, SHAKING (SC0197). APPREHENSION, FEELING OF UNEASINESS, FEAR, ANXIETY (SC0073). DIZZINESS, FEELING FAINT, LIGHT-HEADED, UNSTEADY(SC0048). CONFUSION, IN A BEWILDERED STATE (SC0030). MALAISE, UNEASINESS, DISCOMFORT, FEELING BAD (SC0106). HEADACHE, PAIN IN HEAD OR CRANIUM AREA (SC0075). FATIGUE TIREDNESS, SLUGGISH (SC0066). WEAKNESS, LACK OF STRENGTH (SC0167). ATAXIA, MUSCULAR INCOORDINATION (SC0013). NYSTAGMUS, RHYTHMICAL OSCILLATION OF EYEBALLS (SC0443). TACHYPNEA, RAPID RESPIRATION (SC0384). EXCITABILITY, SENSITIVITY TO EMOTIONAL STIMULATION (SC0592). VOMITING, PERTAINING TO NAUSEA (SC0166). NAUSEA, SICKNESS AT THE STOMACH (SC0115). DIARRHEA, UNCONTROLLED LOOSE BOWELS (SC0046). PARALYSIS, LOSS OF POWER OF VOLUNTARY MOVEMENT (SC0124). ATAXIA, MUSCULAR INCOORDINATION (SC0013). ARRHYTHMIA, ABSENCE OF RHYTHM; IRREGULARITY (SC0010). TACHYCARDIA, ABNORMAL RAPID HEARTBEAT (SC0158). ANEMIA, RED BLOOD CELLS LESS THAN NORMAL (SC0004). BLOOD CHANGES, CHANGES IN BLOOD CELLS OR MORPHOLOGY (SC0227). WEIGHT LOSS, DROP IN BODY WEIGHT (SC0104). ANOREXIA, DIMINISHED APPETITE (SC0006). ANXIETY, A TROUBLED FEELING (SC0009).
KIDNEY, POST-PERITONEUM ORGAN FOR URINE WASTE(SC0094);
EFFECTS, SIGNS AND SYMPTOMS (SC0579). CONVULSIONS, SUDDEN MUSCLE CONTRACTIONS (SC0034). IMMUNOSUPPRESSION, SUPPRESSION OF IMMUNE RESPONSES (SC0630).
LIVER, BILE-SECRETING GLANDULAR ORGAN (SC0620);
TUMORS, BENIGN OR CANCEROUS ENLARGEMENTS (SC0578).
LUNG, RESPIRATORY ORGAN (SC0377);
NEOPLASM, ABNORMAL TISSUE FORMATION (SC0272).
REPRODUCTIVE EFFECTS, BIRTH DEFECTS (SC0281);
IN EXPERIMENTAL ANIMALS, (SC0212).

FA

FIRST AID.

(1 OF 4)
IF THIS CHEMICAL GETS INTO THE EYES, WASH THE EYES IMMEDIATELY WITH LARGE AMOUNTS OF WATER OR NORMAL SALINE, OCCASIONALLY LIFTING UPPER AND LOWER LIDS, UNTIL NO EVIDENCE OF CHEMICAL REMAINS (APPROXIMATELY 15-20 MINUTES). GET MEDICAL ATTENTION IMMEDIATELY.

(2 OF 4)
IF THIS CHEMICAL GETS ON THE SKIN, REMOVE CONTAMINATED CLOTHING AND SHOES IMMEDIATELY. WASH AFFECTED AREA WITH SOAP OR MILD DETERGENT AND LARGE AMOUNTS OF WATER UNTIL NO EVIDENCE OF CHEMICAL REMAINS (APPROXIMATELY 15-20 MINUTES). GET MEDICAL ATTENTION IMMEDIATELY.

(3 OF 4)
IF THIS CHEMICAL HAS BEEN INHALED, REMOVE FROM EXPOSURE AREA TO FRESH AIR IMMEDIATELY. IF BREATHING HAS STOPPED, PERFORM ARTIFICIAL RESPIRATION. KEEP PERSON WARM AND AT REST. TREAT SYMPTOMATICALLY AND SUPPORTIVELY. GET MEDICAL ATTENTION IMMEDIATELY.

(4 OF 4)
HALOGENATED PESTICIDE INGESTION: REMOVE INGESTED PESTICIDE BY IPECAC EMESIS OR GIVE ACTIVATED CHARCOAL FOLLOWED BY GASTRIC LAVAGE WITH 2-4 LITERS OF TAP WATER. FOLLOW WITH A SALINE CATHARTIC. DO NOT GIVE FATS OR OILS. INTESTINAL LAVAGE WITH 20% MANNITOL (200 ML) BY STOMACH TUBE IS ALSO USEFUL. MAINTAIN RESPIRATION, GIVE OXYGEN IF RESPIRATION IS DEPRESSED. GET MEDICAL ATTENTION IMMEDIATELY. GENERAL MEASURES: GIVE DIAZEPAM, 10 MG VERY SLOWLY AS AN ANTICONVULSANT. IF CONVULSIONS PERSIST, USE A NEUROMUSCULAR BLOCKING AGENT AND CONTROLLED RESPIRATION. FOR HYPERACTIVITY OR TREMORS, GIVE PHENOBARBITAL SODIUM, 100 MG SUBCUTANEOUSLY HOURLY UNTIL CONVULSIONS ARE CONTROLLED O UNTIL 0.5 G HAS BEEN GIVEN. DO NOT GIVE STIMULANTS. ALL PROCEDURES MUST BE PERFORMED BY QUALIFIED MEDICAL PERSONNEL ONLY. (DREISBACH, HANDBOOK OF POISONING, 12TH ED.).

MATERIAL SAFETY DATA SHEET

CORPORATE RESEARCH & DEVELOPMENT

SCHENECTADY, N. Y. 12305

Phone: (518) 385-4085 DIAL COMM 8*235-4085

MATERIALS INFORMATION SERVICES

NO. 317

TOLUENE

Revision C

Date August 1979

SECTION I. MATERIAL IDENTIFICATION

MATERIAL NAME: TOLUENE
OTHER DESIGNATIONS: Toluol, Methylbenzene, Phenylmethane, $CH_3C_6H_5$, GE Material D5B11, ASTM D362 and D841, CAS# 000 108 883
MANUFACTURER: Available from many suppliers, including Shell Chemical Co. and Sun Oil Co.

SECTION II. INGREDIENTS AND HAZARDS	%	HAZARD DATA
Toluene *ACGIH (1978); (skin) notation indicates a potential contribution to overall exposure via skin absorption. OSHA/NIOSH (1976) proposed an 8-hr TWA of 100 ppm, with a 15-minute ceiling of 200 ppm, and an action level of 50 ppm. Current OSHA TLV is 200 ppm.	ca 100	8-hr TWA 100 ppm (skin)* or 375 mg/m^3 Human, inhalation TCLo 200 ppm (central nervous syst.) Rat, inhalation LCLo 4000 ppm/4 hr Rat, oral LD_{50} 5000 mg/kg

SECTION III. PHYSICAL DATA

Boiling point, 1 atm, deg F (C)	231 (110.6)	Specific gravity (Water=1)	0.866
Vapor pressure @ 25 C, mm Hg	28	Volatiles, %	100
Vapor density (Air=1)	3.2	Evaporation rate (BuAc=1)	1.9
Solubility in water, %	0.05	Molecular weight	92.15

Appearance & Odor: Water white liquid with a characteristic aromatic odor, whose recognition threshold (unfatigued) is 2-5 ppm (100% of test panel). Odor detection is unsatisfactory for safety because of fatigue.

SECTION IV. FIRE AND EXPLOSION DATA

Flash Point and Method	Autoignition Temp.	Flammability Limits In Air	LOWER	UPPER
40 F (4.4 C) Closed cup	(536 C) 997 F	% by volume	1.2	7

Extinguishing Media: Carbon dioxide, dry chemical, foam, and water fog. Water may be ineffective for putting out fire, but use spray to cool fire-exposed containers.
At room temperature, toluene emits vapors that can form flammable mixtures with air. It is a dangerous fire hazard and a moderate explosion hazard when exposed to heat and flame. Vapors can flow along surfaces to distant ignition sources, then flash back.
Firefighters should wear self-contained breathing apparatus and eye protection when fighting toluene fires.

SECTION V. REACTIVITY DATA

Toluene is a stable material under normal storage and handling. It does not undergo hazardous polymerization.
Since toluene is a flammable liquid, avoid contact with heat, sparks or open flames. Avoid contact with strong oxidizing agents. Nitric acid and toluene, especially in combination with sulfuric acid, will produce nitrated compounds which are dangerously explosive.
Oxidation in air can form oxides of carbon and nitrogen.

SECTION VI. HEALTH HAZARD INFORMATION

TLV 100 ppm (skin) (See Sect. II)

Vapor inhalation can produce headache and slight drowsiness at 100 ppm, fatigue, nausea and itching skin at 100-200 ppm, anesthetic effects and respiratory tract and eye irritation above 200 ppm. Absorption can occur through the skin, and liquid contact will cause defatting of the skin, with possible dermatitis from repeated or prolonged contact. Eye contact is irritating and can be damaging (corneal burns). Ingestion irritates the digestive tract and results in systemic effects from absorption.

FIRST AID:

Eye Contact: Immediately irrigate with water for 15 minutes. Get medical help.

Skin Contact: Wash area with soap & water; remove contaminated clothing promptly. Get medical help if irritation persists or if large areas of skin were exposed.

Inhalation: Remove to fresh air; restore breathing and give oxygen if needed. Get medical help!

Ingestion: Get medical help as soon as possible! When victim is conscious, give USP mineral oil to drink. (Aspiration is a potential hazard if vomiting occurs!)

SECTION VII. SPILL, LEAK, AND DISPOSAL PROCEDURES

Report large spills to safety personnel. Remove ignition sources; provide explosion-proof ventilation. Those involved in clean-up must use protection again liquid contact and vapor inhalation. Pick as liquid when feasible, or absorb on vermiculite or sand and scoop up with nonsparking tools into a metal container with cover. Liquid can be flushed with a water spray to an open holding area for handling. Do not flush to sewer, to a confined space, or to a watercourse!

DISPOSAL: Consider reclaiming by distillation or disposal via a licensed waste disposal company. Scrap may be incinerated under properly controlled conditions. Follow Federal, State and local regulations.

SECTION VIII. SPECIAL PROTECTION INFORMATION

Provide general and exhaust ventilation to meet TLV requirements. Ventilation fans & other electrical service must be nonsparking and explosion proof. Exhaust hoods should have >100 lfm face velocity and be designed to capture heavy vapors. Exposure above the TLV for nonroutine and emergency situations requires use of an organic chemical cartridge respirator up to 200 ppm; above 200 ppm a full face piece is required with an approved canister-type gas mask or self-contained breathing equipment.

Safety goggles or glasses should be worn in areas of use. Impermeable (neoprene has been recommended) gloves and apron, face shield, and other protective clothing may be needed to prevent skin contact during use, especially where splashing may occur. An eyewash station should be available if splashing is possible. A safety shower and washing facilities should be available.

SECTION IX. SPECIAL PRECAUTIONS AND COMMENTS

Store in cool, clean, well-ventilated area away from sources of heat and ignition and away from oxidizing agents. Area must meet requirements of OSHA Class IB liquid. No smoking in areas of storage or use. Nonsparking tools should be used near toluene. Use safety cans for handling small amounts. Ground and bond metal containers for liquid transfers to prevent static sparks. Protect containers from physical damage.

Preplacement and periodic medical exams emphasizing the liver, kidneys, nervous system, lungs, heart and blood should be provided. At least an annual exam is recommended for workers exposed above the action level (50 ppm). Use of alcohol can aggravate the narcotic effect and blood effects of toluene.

DATA SOURCE(S) CODE: 1-9,12,20,21,24,26

APPROVALS: MIS, CRD J. M. Nielsen

Industrial Hygiene and Safety

MEDICAL REVIEW: 12/79

AN ACCESSION NUMBER: 1171. 9112.
CN CHEMICAL NAME: ETHYL BENZENE.
SY SYNONYMS: PHENYLETHANE. ETHYLBENZOL. NCI-C56393. UN 1175.
ETHYLBENZENE. BENZENE, ETHYL. EB. ALPHA-METHYLTOLUENE. STCC 4909163.
RN CAS NUMBER: 100-41-4.

REG. TOXIC NUMBER: DA0700000.

CHEMICAL FORMULA: C8H10.

PD

PHYSICAL DESCRIPTION:
CLEAR, COLORLESS LIQUID WITH AN AROMATIC ODOR.

MOL WT:	106.17
BOILING PT:	277 F (136 C)
SOLUBILITY:	0.015%
FLASH PT:	59 F (15 C)
VAPOR PRES:	7.1 MMHG
MELT PT:	-139 F (-95 C)
UEL IN AIR:	6.7%
LEL IN AIR:	0.8%
MEC IN AIR:	810 F (432 C)
SPEC GRAVITY:	0.867
VAPOR DENSITY:	3.7
ODOR THRESHOLD:	140 PPM
OCTANOL/WATER CO-EFFICIENT:	3.15.

EL

PERMISSABLE EXPOSURE:
100 PPM OSHA TWA; 125 PPM OSHA STEL
100 PPM ACGIH TWA; 125 PPM ACGIH STEL
100 PPM NIOSH RECOMMENDED 10 HR TWA; 125 PPM NIOSH RECOMMENDED STEL
REPRODUCTIVE EFFECTS DATA (RTECS); MUTAGENIC DATA (RTECS)
AQUATIC TOXICITY RATING 2 (TLM96 10 - 100 PPM)
TLM96 - BLUEGILL 32 PPM (SOFT WATER), FATHEAD 48.51 PPM (SOFT WATER) - FATHEAD 42.33 PPM (HARD WATER)
CERCLA HAZARD RATINGS - TOXICITY 2 - IGNITABILITY 3 - REACTIVITY 0 - PERSISTENCE 3
TOXICOLOGY: ETHYL BENZENE IS A SKIN, EYE AND MUCOUS MEMBRANE IRRITANT. IT IS MODERATELY TOXIC BY INGESTION AND SLIGHTLY TOXIC BY SKIN ABSORPTION. ETHYL BENZENE IS A CENTRAL NERVOUS SYSTEM DEPRESSANT. POISONING MAY AFFECT THE LIVER. SYMPTOMS MAY INCLUDE A SENSE OF CHEST CONSTRICTION AND FUNCTIONAL NERVOUS DISORDERS. SKIN CONTACT MAY RESULT IN FIRST AND SECOND DEGREE BURNS.
THE ODOR CAN BE DETECTED AT 140 PPM AND IRRITATION OCCURS AT 200 PPM; THESE ARE CONSIDERED TO BE ADEQUATE WARNING PROPERTIES. THE THRESHOLD LIMIT VALUE WAS SET TO PREVENT SKIN AND EYE IRRITATION. PERSONS WITH PRE-EXISTING SKIN DISORDERS OR IMPAIRED PULMONARY, KIDNEY OR LIVER FUNCTION MAY BE AT INCREASED RISK FROM EXPOSURE.

ETHYL BENZENE MAY CROSS THE PLACENTA.
IHL-HMN TCLO: 100 PPM/8H ORL-RAT LD50: 3500 MG/KG
SKN-RBT LD50: 17,800 MG/KG IPR-MUS LD50: 2272 MG/KG
IHL-RAT LCLO: 4000 PPM/4H IHL-MUS LDLO: 50 GM/M3/2H
IHL-GPG LCLO: 10,000 PPM
SKIN AND EYE IRRITATION DATA (RTECS)
SKN-RBT 15 MG/24H MLD EYE-RBT 100 MG

OSHA STANDARD 1910.1200 HAZARD COMMUNICATION REQUIRES CHEMICAL MANUFACTURERS AND IMPORTERS TO ASSESS THE HAZARDS OF CHEMICALS WHICH THEY PRODUCE OR IMPORT, AND ALL EMPLOYERS TO PROVIDE INFORMATION TO THEIR EMPLOYEES CONCERNING HAZARDOUS CHEMICALS BY MEANS OF A HAZARD COMMUNICATION PROGRAM, LABELS AND OTHER FORMS OF WARNING, MATERIAL SAFETY DATA SHEETS, AND INFORMATION AND TRAINING. REQUIRES DISTRIBUTORS TO TRANSMIT REQUIRED INFORMATION TO EMPLOYEES.

DANGEROUS EXPOSURE:
2000 PPM OSHA/NIOSH
CLEAR, COLORLESS LIQUID WITH A.

IC

INCOMPATIBILITIES:
ETHYL BENZENE: ACIDS (STRONG): POSSIBLE VIOLENT REACTION. AMMONIA: POSSIBLE VIOLENT REACTION. BASES (STRONG): POSSIBLE VIOLENT REACTION. OXIDIZERS (STRONG): FIRE AND EXPLOSION HAZARD. PLASTICS: MAY BE ATTACKED. THERMAL DECOMPOSITION PRODUCTS MAY INCLUDE TOXIC OXIDES OF CARBON. VAPOR-AIR MIXTURES ARE EXPLOSIVE. VAPORS ARE HEAVIER THAN AIR AND MAY TRAVEL A CONSIDERABLE DISTANCE TO A SOURCE OF IGNITION AND FLASH BACK. DUE TO LOW ELECTROCONDUCTIVITY OF THE SUBSTANCE, FLOW OR AGITATION MAY GENERATE ELECTROSTATIC CHARGES RESULTING IN SPARKS WITH POSSIBLE IGNITION.

CL

CLOTHING:
FOLLOWING INFORMATION FROM NIOSH/OSHA "OCCUPATIONAL HEALTH GUIDELINES FOR CHEMICAL HAZARDS":
EMPLOYERS SHALL PROVIDE AND ENSURE THAT EMPLOYEES USE APPROPRIATE PROTECTIVE CLOTHING AND EQUIPMENT NECESSARY TO PREVENT REPEATED OR PROLONGED SKIN CONTACT WITH THIS SUBSTANCE. FACE SHIELDS SHALL COMPLY WITH 29CFR1910.133(A)(2), (A)(4), (A)(5), AND (A)(6).
EMPLOYERS SHALL ENSURE THAT CLOTHING WET WITH THIS SUBSTANCE IS PLACED IN CLOSED CONTAINERS FOR STORAGE UNTIL IT CAN BE DISCARDED OR UNTIL THE EMPLOYER PROVIDES FOR THE REMOVAL OF THE CONTAMINANT FROM THE CLOTHING. IF THE CLOTHING IS TO BE LAUNDERED OR OTHERWISE CLEANED TO REMOVE THE CONTAMINANT, THE EMPLOYER SHALL INFORM THE PERSON PERFORMING THE CLEANING OPERATION OF THE HAZARDOUS PROPERTIES OF THE SUBSTANCE.
-ACGIH "GUIDELINES FOR THE SELECTION OF CHEMICAL PROTECTIVE CLOTHING" INDICATED THE FOLLOWING PROTECTIVE RATINGS FOR MATERIALS COMMONLY USED FOR PROTECTIVE CLOTHING. THESE RATINGS ARE BASED PRIMARILY ON QUANTITATIVE TEST RESULTS AND QUALITATIVE RESISTANCE INFORMATION. (THE RECOMMENDATIONS APPLY TO THE PURE SUBSTANCE ONLY; BREAKTHROUGH-TIME MAY VARY FOR MIXTURES.) (A "+" DESIGNATES A BLEND OF MATERIALS, WHILE A "/" DESIGNATES A COATED OR LAMINATED MATERIAL.) -
AROMATIC HYDROCARBONS: EXCELLENT/GOOD: VITON GOOD/FAIR: CHLORINATED POLYETHYLENE VITON/NEOPRENE POOR/FAIR: BUTYL/NEOPRENE POOR: NATURAL RUBBER NEOPRENE NITRILE+POLYVINYL CHLORIDE POLYETHYLENE POLYVINYL CHLORIDE *** THERE IS A WIDE VARIATION IN RATINGS FOR THE FOLLOWING MATERIALS *** BUTYL RUBBER NITRILE RUBBER POLYVINYL ALCOHOL.

WEAR EYE PROTECTION TO PREVENT:

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FOLLOWING INFORMATION FROM NIOSH/OSHA "OCCUPATIONAL HEALTH GUIDELINES FOR CHEMICAL HAZARDS":
EMPLOYERS SHALL PROVIDE AND ENSURE THAT EMPLOYEES USE SPLASH-PROOF SAFETY GOGGLES WHICH COMPLY WITH 29CFR1910.133(A)(2)-(A)(6) WHERE THIS LIQUID MAY CONTACT THE EYES.

EMPLOYEE SHOULD WASH:
FOLLOWING INFORMATION FROM NIOSH/OSHA "OCCUPATIONAL HEALTH GUIDELINES FOR CHEMICAL HAZARDS":
EMPLOYERS SHALL ENSURE THAT EMPLOYEES WHOSE SKIN BECOMES CONTAMINATED WITH THIS SUBSTANCE PROMPTLY WASH OR SHOWER TO REMOVE ANY CONTAMINANT FROM THE SKIN.

WORK CLOTHING SHOULD BE CHANGED DAILY:
NO SPECIFIC REQUIREMENT. IF INDICATED BY THE NATURE OF THE CONTAMINANT AND THE EXTENT OF EXPOSURE, CHANGE INTO UNCONTAMINATED CLOTHING BEFORE LEAVING THE WORK PREMISES.

REMOVE CLOTHING:
FOLLOWING INFORMATION FROM NIOSH/OSHA "OCCUPATIONAL HEALTH GUIDELINES FOR CHEMICAL HAZARDS":
EMPLOYERS SHALL ENSURE THAT NON-IMPERVIOUS CLOTHING WHICH BECOMES CONTAMINATED WITH THIS SUBSTANCE BE REMOVED PROMPTLY AND NOT REWORN UNTIL THE SUBSTANCE IS REMOVED FROM THE CLOTHING.
EMPLOYERS SHALL ENSURE THAT ANY CLOTHING WHICH BECOMES WET WITH THIS FLAMMABLE LIQUID BE REMOVED IMMEDIATELY AND NOT REWORN UNTIL THE SUBSTANCE IS REMOVED FROM THE CLOTHING.

THE FOLLOWING EQUIPMENT SHOULD BE AVAILABLE:
NO SPECIFIC REQUIREMENT. IF INDICATED BY THE NATURE OF THE SUBSTANCE AND THE PROBABILITY OF EXPOSURE, PROVIDE AN EYE WASH AND FACILITIES FOR QUICK DRENCHING OF THE BODY WITHIN THE IMMEDIATE WORK AREA FOR EMERGENCY USE.
RP
RESPIRATOR SELECTION (UPPER LIMIT DEVICES PERMITTED):
1000 PPM
- POWERED AIR-PURIFYING RESPIRATOR WITH AN ORGANIC VAPOR CARTRIDGE
- SUPPLIED-AIR RESPIRATOR
- SELF-CONTAINED BREATHING APPARATUS
- CHEMICAL CARTRIDGE RESPIRATOR WITH AN ORGANIC VAPOR CARTRIDGE

2000 PPM
- GAS MASK WITH AN ORGANIC VAPOR CANISTER (CHIN-STYLE OR FRONTOR BACK-MOUNTED CANISTER)
- SUPPLIED-AIR RESPIRATOR WITH A FULL FACE-PIECE
- SELF-CONTAINED BREATHING APPARATUS WITH A FULL FACE-PIECE

ESCAPE
- GAS MASK WITH AN ORGANIC VAPOR CANISTER (CHIN-STYLE OR FRONTOR BACK-MOUNTED CANISTER)
- APPROPRIATE ESCAPE-TYPE SELF-CONTAINED BREATHING APPARATUS

FIREFIGHTING
- SELF-CONTAINED BREATHING APPARATUS WITH A FULL FACE-PIECE OPERATED IN PRESSURE-DEMAND OR POSITIVE-PRESSURE MODE
- SUPPLIED-AIR RESPIRATOR WITH A FULL FACEPIECE OPERATED IN PRESSURE-DEMAND OR OTHER POSITIVE PRESSURE MODE WITH AUXILIARY SELF-CONTAINED BREATHING APPARATUS OPERATED IN POSITIVE PRESSURE MODE.

MS

MEDICAL SURVEILLANCE:
EKG RECOMMENDED IF EMPLOYEE TO WEAR FULL-FACE RESPIRATOR.
GENERAL MEDICAL HISTORY.
40CFR717 RECORDS AND REPORTS OF ALLEGATIONS THAT CHEMICAL SUBSTANCES CAUSE SIGNIFICANT ADVERSE REACTIONS TO HEALTH OR THE ENVIRONMENT TOXIC SUBSTANCES CONTROL ACT (TSCA) SECTION 8(C) RULE REQUIRES MANUFACTURERS AND CERTAIN PROCESSORS OF CHEMICAL SUBSTANCES AND MIXTURES TO KEEP RECORDS OF SIGNIFICANT ADVERSE REACTIONS TO EMPLOYEE HEALTH FOR 30 YEARS.
PHYSICIAN PRE-PLACEMENT AND ANNUAL EXAMS.
MEDICAL WARNING FOR REFUSAL OF MEDICAL EXAMINATION.
OSHA: CHRONIC RESPIRATORY DISEASE.
KIDNEY FUNCTION.
LIVER FUNCTION.
SKIN DISEASE.
OTHER MEDICAL SURVEILLANCE RECOMMENDED: BLOOD DISEASE.
EYE DISEASE.
ACGIH BIOLOGICAL EXPOSURE INDICES FOR ETHYL BENZENE: 2 G/L MANDELIC ACID IN URINE / TIMING--END OF SHIFT AND END OF WORKWEEK 1.5 G/G CREAT.
MANDELIC ACID IN URINE / TIMING -END OF SHIFT AND END OF WORKWEEK 2 PPM ETHYL BENZENE IN END-EXHALED AIR /TIMING--PRIOR TO NEXT SHIFT.
29CFR1910.20 OSHA STANDARD SUBPART C - GENERAL SAFETY AND HEALTH PROVISIONS PROVIDES FOR EMPLOYEE, DESIGNATED REPRESENTATIVE, AND OSHA ACCESS TO EMPLOYER-MAINTAINED EXPOSURE AND MEDICAL RECORDS RELEVANT TO EMPLOYEES EXPOSED TO TOXIC SUBSTANCES AND HARMFUL PHYSICAL AGENTS.
53FR38140 9/29/88 (AMENDED).

RE

ROUTE OF ENTRY:
INHALATION. INGESTION. SKIN ABSORPTION. SKIN OR EYE CONTACT.

TO

TARGET ORGANS:
EYES. SKIN. RESPIRATORY SYSTEM. CENTRAL NERVOUS SYSTEM. GASTROINTESTINAL. LIVER.

SP

SYMPTOMS:
SKIN, COVERING OF BODY (SC0174);
IRRITATION, EXTREME REACTION TO A CONDITION (SC0090).
EYE, ORGAN OF SIGHT (SC0170);
IRRITATION, EXTREME REACTION TO A CONDITION (SC0090).
MUCOUS MEMBRANE, MEMBRANE LINING PASSAGES/CAVITIES (SC0109);
IRRITATION, EXTREME REACTION TO A CONDITION (SC0090). COUGHING, FORCEFUL EXPIRATION (SC0173). FATIGUE, TIREDNESS, SLUGGISH (SC0066). DEPRESSION DECREASE IN ACTIVITY/FUNCTION (SC0043). DIZZINESS, FEELING FAINT, LIGHT-HEADED, UNSTEADY(SC0048). VERTIGO, FEELING OF WHIRLING MOTION (SC0163). DYSPNEA, DIFFICULTY IN BREATHING (SC0052). HEADACHE, PAIN IN HEAD OR CRANIUM AREA (SC0075). NARCOSIS, STUPOR OR SLEEP DUE TO NARCOTIC (SC0113). SLEEPINESS, DROWSINESS (SC0150). IRRITABILITY, QUICK EXCITABILITY TO ANNOYANCE (SC0091).
SKIN, COVERING OF BODY (SC0174);
INFLAMMATION, EXTREME INFLAMMATORY TISSUE REACTION (SC0086).
SKIN, COVERING OF BODY (SC0174);
BURNS, TISSUE DAMAGE FROM HEAT (SC0175). LACRIMATION, DISCHARGE OF TEARS (SC0096).
ABDOMINAL, SECTION BETWEEN THORAX AND PELVIS (SC0750);
PAIN, SUFFERING, EITHER PHYSICAL OR MENTAL (SC0182). NAUSEA, SICKNESS AT THE STOMACH (SC0115). VOMITING, PERTAINING TO NAUSEA (SC0166).
PULARY, PERTAINING TO THE RESPIRATORY TRACT (SC0500);

HEMORRHAGE, BLEEDING (SC0080).
PULMONARY, PERTAINING TO THE RESPIRATORY TRACT (SC0500);
EDEMA, FLUID RETENTION WITH SWELLING (SC0181). COMA, STATE OF DEEP UNCONSCIOUSNESS (SC0583).
RESPIRATORY, PERTAINING TO THE LUNGS (SC0142);
PARALYSIS, LOSS OF POWER OF VOLUNTARY MOVEMENT (SC0124).
LIVER, BILE-SECRETING GLANDULAR ORGAN (SC0620);
EFFECTS, SIGNS AND SYMPTOMS (SC0579).
KIDNEY, POST-PERITONEUM ORGAN FOR URINE WASTE(SC0094);
EFFECTS, SIGNS AND SYMPTOMS (SC0579).
BLOOD, FLUID WHICH CARRIES NUTRIMENT AND OXYGEN TO BODY CELLS (SC0769);
EFFECTS, SIGNS AND SYMPTOMS (SC0579).
REPRODUCTIVE EFFECTS, BIRTH DEFECTS (SC0281);
IN EXPERIMENTAL ANIMALS, (SC0212).

FA

FIRST AID.

(1 OF 6)
IF THIS CHEMICAL GETS INTO THE EYES, WASH THE EYES IMMEDIATELY WITH LARGE AMOUNTS OF WATER OR NORMAL SALINE, OCCASIONALLY LIFTING UPPER AND LOWER LIDS, UNTIL NO EVIDENCE OF CHEMICAL REMAINS (APPROXIMATELY 15-20 MINUTES). GET MEDICAL ATTENTION IMMEDIATELY.

(2 OF 6)
IF THIS CHEMICAL GETS ON THE SKIN, REMOVE CONTAMINATED CLOTHING AND SHOES IMMEDIATELY. WASH AFFECTED AREA WITH SOAP OR MILD DETERGENT AND LARGE AMOUNTS OF WATER UNTIL NO EVIDENCE OF CHEMICAL REMAINS (AT LEAST 15-20 MINUTES). IN CASE OF CHEMICAL BURNS, COVER AREA WITH STERILE, DRY DRESSING. BANDAGE SECURELY, BUT NOT TOO TIGHTLY. GET MEDICAL ATTENTION IMMEDIATELY.

(3 OF 6)
IF THIS CHEMICAL HAS BEEN INHALED, REMOVE FROM EXPOSURE AREA TO FRESH AIR IMMEDIATELY. IF BREATHING HAS STOPPED, GIVE ARTIFICIAL RESPIRATION. MAINTAIN AIRWAY AND BLOOD PRESSURE AND ADMINISTER OXYGEN IF AVAILABLE. KEEP AFFECTED PERSON WARM AND AT REST. ADMINISTRATION OF OXYGEN SHOULD BE PERFORMED BY QUALIFIED PERSONNEL. TREAT SYMPTOMATICALLY AND SUPPORTIVELY. GET MEDICAL ATTENTION IMMEDIATELY.

(4 OF 6)
INGESTION OF PETROLEUM DISTILLATES/HYDROCARBONS: EMERGENCY TREATMENT - PREVENT ASPIRATION. IF AMOUNT INGESTED EXCEEDS 1 ML/KG, OR IF TOXIC INGREDIENT IS PRESENT, SUBSTANCE MUST BE REMOVED. GASTRIC LAVAGE WITH ACTIVATED CHARCOAL AND CUFFED ENDOTRACHEAL TUBE TO PREVENT ASPIRATION SHOULD BE PERFORMED 15 MINUTES. IN ABSENCE OF DEPRESSION, CONVULSIONS OR GAG REFLEX, IPECAC EMESIS CAN ALSO BE DONE WITHOUT INCREASING ASPIRATION HAZARD. WHEN VOMITING OCCURS, HOLD PATIENT WITH HEAD LOWER THAN HIPS TO PREVENT ASPIRATION. AFTER VOMITING CEASES, GIVE 30-60 ML OF FLEET'S PHOSPHO-SODA DILUTED 1:4 IN WATER. FURTHER TREATMENT: GIVE ARTIFICIAL RESPIRATION WITH OXYGEN IF NECESSARY. SPECIAL TREATMENT: TREAT BACTERIAL ASPIRATION PNEUMONIA BY ORGANISM SPECIFIC CHEMOTHERAPY. TREAT PULMONARY EDEMA. (DREISBACH, HANDBOOK OF POISONING, 12TH ED.).

(5 OF 6)
GASTRIC LAVAGE - GIVE PATIENT GLASS OF WATER PRIOR TO PASSING OF STOMACH TUBE. LAY PATIENT ON ONE SIDE, WITH HEAD LOWER THAN WAIST. IMMOBILIZE A STRUGGLING PATIENT WITH A SHEET OR BLANKET. MEASURE DISTANCE ON TUBE FROM MOUTH TO EPIGASTRIUM, MARK TUBE WITH INDELIBLE MARKING OR TAPE.

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NTER DOCUMENT SELECTION._: 2-14

2

N ACCESSION NUMBER: 322. 9112.
CN CHEMICAL NAME: BENZENE.
SY SYNONYMS: BENZOL. CYCLOHEXATRIENE. COAL TAR NAPHTHA. PHENYL HYDRIDE. NCI-C55276. BENZINE. BENZOLE. ANNULENE. (6)ANNULENE. UN 1114. BENZOLENE. BICARBURET OF HYDROGEN. CARBON OIL. COAL NAPHTHA. STCC 4908110. MOTOR BENZOL. RCRA U019. PHENE. PYROBENZOL. PYROBENZOLE.
RN CAS NUMBER: 71-43-2.

REG. TOXIC NUMBER: CY1400000.

CHEMICAL FORMULA: C6H6.

D
PHYSICAL DESCRIPTION:
COLORLESS TO LIGHT YELLOW LIQUID WITH AN AROMATIC ODOR.

MOL WT:	78.08
BOILING PT:	176 F (80 C)
SOLUBILITY:	0.18% @ 25 C
FLASH PT:	12 F (-11 C)
VAPOR PRES:	74.6 MMHG
MELT PT:	42 F (6 C)
UEL IN AIR:	7.9%
LEL IN AIR:	1.3%
MEC IN AIR:	928 F (498 C)
SPEC GRAVITY:	0.877
VAPOR DENSITY:	2.8
ODOR THRESHOLD:	1.5 - 5 PPM
OCTANOL/WATER CO-EFFICIENT:	2.13.

L
PERMISSABLE EXPOSURE:
1 PPM OSHA TWA; 5 PPM OSHA 15 MIN STEL; 0.5 PPM OSHA ACTION LEVEL
10 PPM ACGIH TWA;(NOIC 90-91);ACGIH A2 - SUSPECTED HUMAN CARCINOGEN
0.1 PPM NIOSH RECOMMENDED 10 HR TWA; 1 PPM NIOSH RECOMMENDED STEL
OSHA CARCINOGEN; KNOWN HUMAN CARCINOGEN (NTP)
HUMAN SUFFICIENT EVIDENCE FOR CARCINOGENICITY (IARC GROUP-1)
ANIMAL SUFFICIENT EVIDENCE FOR CARCINOGENICITY (IARC GROUP-1)
HUMAN CARCINOGEN (EPA - CATEGORY A)
REPRODUCTIVE EFFECTS DATA (RTECS); MUTAGENIC DATA (RTECS)
TUMORIGENIC DATA (RTECS)
AQUATIC TOXICITY RATING 2 (TLM96 10-100 PPM)
BLUEGILLS 24.49 PPM
CERCLA HAZARD RATINGS - TOXICITY 3 - IGNITABILITY 3 - REACTIVITY 0 - PERSISTENCE 1
TOXICOLOGY: BENZENE IS A SKIN AND EYE IRRITANT. IT IS MODERATELY TOXIC BY INGESTION AND SLIGHTLY TOXIC BY INHALATION. BENZENE IS A CENTRAL NERVOUS SYSTEM DEPRESSANT AND BONE MARROW DEPRESSANT. POISONING MAY ALSO AFFECT THE IMMUNE, HEMATOPOIETIC AND NERVOUS SYSTEMS. EXPOSURE MAY CAUSE WEAKNESS, SOMETIMES PRECEDED BY A BRIEF PERIOD OF EUPHORIA, CARDIAC ARRHYTHMIAS AND COMA. CHRONIC EXPOSURE MAY CAUSE DECREASED BLOOD PRESSURE, INCREASED SERUM BILIRUBIN LEVELS, APLASTIC ANEMIA AND IMMUNOSUPRESSION. EPIDEMILOGICAL STUDIES HAVE ESTABLISHED A RELATIONSHIP BETWEEN PROLONGED BENZENE EXPOSURE AND LEUKEMIA.
THE THRESHOLD LIMIT VALUE WAS ESTABLISHED TO PREVENT TOXIC EFFECTS.

PERSONS WITH CERTAIN IMMUNOLOGICAL TENDENCIES MAY BE AT INCREASED RISK.
ALCOHOLIC BEVERAGES MAY INCREASE TOXIC EFFECTS. STIMULANTS, SUCH AS EPINEPHRINE, MAY CAUSE CARDIAC ARRYTHMIAS.
ORL-MAN LDLO: 50 MG/KG IHL-MAN TCLO: 150 PPM/1Y-I
IHL-MAN LCLO: 2 PPH/5M IHL-HMN LCLO: 2000 PPM/5M
IHL-HMN TCLO: 100 PPM IHL-HMN LCLO: 65 MG/M3/5Y
ORL-RAT LD50: 3306 MG/KG ORL-MUS LD50: 4700 MG/KG
IHL-RAT LC50: 10,000 PPM/7H IHL-MUS LC50: 9980 PPM
IPR-RAT LD50: 2890 UG/KG IPR-MUS LD50: 340 MG/KG
ORL-DOG LDLO: 2000 MG/KG IHL-CAT LCLO: 170,000 MG/KG

OSHA STANDARD 1910.1200 HAZARD COMMUNICATION REQUIRES CHEMICAL MANUFACTURERS AND IMPORTERS TO ASSESS THE HAZARDS OF CHEMICALS WHICH THEY PRODUCE OR IMPORT, AND ALL EMPLOYERS TO PROVIDE INFORMATION TO THEIR EMPLOYEES CONCERNING HAZARDOUS CHEMICALS BY MEANS OF A HAZARD COMMUNICATION PROGRAM, LABELS AND OTHER FORMS OF WARNING, MATERIAL SAFETY DATA SHEETS, AND INFORMATION AND TRAINING. REQUIRES DISTRIBUTORS TO TRANSMIT REQUIRED INFORMATION TO EMPLOYEES.

DANGEROUS EXPOSURE:
3000 PPM POTENTIAL
CARCINOGENOSHA/NIOSH
COLORLESS TO LIGHT YELLOW LIQU.

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INCOMPATIBILITIES:
SEND BACK AREA EXCEDED. ACIDS (STRONG): INCOMPATIBLE ALLYL CHLORIDE WITH DICHLOROETHYL ALUMINUM OR ETHYLALUMINUM SESQUICHLORIDE: POSSIBLE EXPLOSION ARSENIC PENTAFLUORIDE + POTASSIUM METHOXIDE: EXPLOSIVE INTERACTION BASES (STRONG): INCOMPATIBLE BROMINE PENTAFLUORIDE: FIRE AND EXPLOSION HAZARD BROMINE TRIFLUORIDE: POSSIBLE EXPLOSION OR IGNITION BROMINE + IRON: INCOMPATIBLE CHLORINE: EXPLOSION IN THE PRESENCE OF LIGHT CHLORINE TRIFLUORIDE: VIOLENT REACTION WITH POSSIBLE EXPLOSION CHROMIC ANHYDRIDE (POWDERED): IGNITION DIBORANE: SPONTANEOUSLY EXPLOSIVE REACTION IN AIR DIOXYGEN DIFLUOROBORATE: IGNITION REACTION DIOXYGENYL TETRAFLUOROBORATE: IGNITION REACTION INTERHALOGEN COMPOUNDS: IGNITION OR EXPLOSION IODINE HEPTAFLUORIDE: IGNITION ON CONTACT IODINE PENTAFLUORIDE: VIOLENT INTERACTION ABOVE 50 C NITRIC ACID: VIOLENT OR EXPLOSIVE UNLESS PROPERLY AGITATED AND COOLED NITRYL PERCHLORATE: EXPLOSIVE INTERACTION OXIDIZERS (STRONG): FIRE AND EXPLOSION HAZARD OXYGEN (LIQUID): EXPLOSIVE MIXTURE OZONE: FORMATION OF GELATINOUS OZONIDE PERCHLORATES (METAL): FORMATION OF EXPLOSIVE COMPLEX.

:L

CLOTHING:
29CFR1910.1028 BENZENE PERSONAL PROTECTIVE CLOTHING AND EQUIPMENT SHALL BE WORN WHERE APPROPRIATE TO PREVENT EYE CONTACT AND LIMIT DERMAL EXPOSURE TO LIQUID BENZENE. PROTECTIVE CLOTHING AND EQUIPMENT SHALL BE PROVIDED BY THE EMPLOYER AT NO COST TO THE EMPLOYEE AND THE EMPLOYER SHALL ASSURE ITS USE WHERE APPROPRIATE.
-ACGIH "GUIDELINES FOR THE SELECTION OF CHEMICAL PROTECTIVE CLOTHING" INDICATED THE FOLLOWING PROTECTIVE RATINGS FOR MATERIALS COMMONLY USED FOR PROTECTIVE CLOTHING. THESE RATINGS ARE BASED PRIMARILY ON QUANTITATIVE TEST RESULTS AND QUALITATIVE RESISTANCE INFORMATION. (THE RECOMMENDATIONS APPLY TO THE PURE SUBSTANCE ONLY; BREAKTHROUGH-TIME MAY VARY FOR MIXTURES.) (A "+" DESIGNATES A BLEND OF MATERIALS, WHILE A "/" DESIGNATES A COATED OR LAMINATED MATERIAL.) -
BENZENE: EXCELLENT/GOOD: NONE INDICATED GOOD/FAIR: VITON/NEOPRENE BUTYL/NEOPRENE POLYVINYL ACETATE SILVERSHIELD POOR/FAIR: CHLORINATED

POLYETHYLENE VITON NEOPRENE+STYRENE-BUTADIENE RUBBER STYRENE-BUTADIENE RUBBER/NEOPRENE POOR: BUTYL RUBBER NEOPRENE NATURAL RUBBER POLYVINYL ALCOHOL POLYVINYL CHLORIDE EVA TEFLON POLYURETHANE NONWOVEN POLYETHYLENE SARANEX STYRENE-BUTADIENE RUBBER NEOPRENE/NATURAL RUBBER NITRILE+POLYVINYL CHLORIDE NITRILE RUBBER POLYETHYLENE.

WEAR EYE PROTECTION TO PREVENT:
29CFR1910.1028 BENZENE EYE AND FACE PROTECTION SHALL MEET THE REQUIREMENTS OF 29CFR1910.133.
FOLLOWING INFORMATION FROM NIOSH/OSHA "OCCUPATIONAL HEALTH GUIDELINES FOR CHEMICAL HAZARDS":
EMPLOYERS SHALL PROVIDE AND ENSURE THAT EMPLOYEES USE SPLASH-PROOF SAFETY GOGGLES WHICH COMPLY WITH 29CFR1910.133(A)(2)-(A)(6) WHERE THIS LIQUID MAY CONTACT THE EYES.

EMPLOYEE SHOULD WASH:
NO SPECIFIC REGULATIONS UNDER 29CFR1910.
FOLLOWING INFORMATION FROM NIOSH/OSHA "OCCUPATIONAL HEALTH GUIDELINES FOR CHEMICAL HAZARDS":
EMPLOYERS SHALL ENSURE THAT EMPLOYEES WHOSE SKIN BECOMES WET WITH THIS SUBSTANCE PROMPTLY WASH OR SHOWER WITH SOAP OR MILD DETERGENT AND WATER TO REMOVE ANY CONTAMINANT FROM THE SKIN.

WORK CLOTHING SHOULD BE CHANGED DAILY:
NO SPECIFIC REGULATIONS UNDER 29CFR1910.
FOLLOWING INFORMATION FROM NIOSH/OSHA "OCCUPATIONAL HEALTH GUIDELINES FOR CHEMICAL HAZARDS":
NOT REQUIRED.

REMOVE CLOTHING:
NO SPECIFIC REGULATIONS UNDER 29CFR1910.
FOLLOWING INFORMATION FROM NIOSH/OSHA "OCCUPATIONAL HEALTH GUIDELINES FOR CHEMICAL HAZARDS":
EMPLOYERS SHALL ENSURE THAT ANY CLOTHING WHICH BECOMES WET WITH THIS FLAMMABLE LIQUID BE REMOVED IMMEDIATELY AND NOT REWORN UNTIL THE SUBSTANCE IS REMOVED FROM THE CLOTHING.

THE FOLLOWING EQUIPMENT SHOULD BE AVAILABLE:
NO SPECIFIC REGULATIONS UNDER 29CFR1910.
NO SPECIFIC REQUIREMENT. IF INDICATED BY THE NATURE OF THE SUBSTANCE AND THE PROBABILITY OF EXPOSURE, PROVIDE AN EYE WASH AND FACILITIES FOR QUICK DRENCHING OF THE BODY WITHIN THE IMMEDIATE WORK AREA FOR EMERGENCY USE.

RESPIRATOR SELECTION (UPPER LIMIT DEVICES PERMITTED):
BENZENE
THE FOLLOWING RESPIRATORS ARE THE MINIMUM LEGAL REQUIREMENT AS SET FORTH BY THE OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION FOUND IN 29CFR1910, SUBPART Z. LESS THAN OR EQUAL TO 10 PPM - HALF-MASK AIR-PURIFYING RESPIRATOR WITH ORGANIC VAPOR CARTRIDGE LESS THAN OR EQUAL TO 50 PPM - FULL FACEPIECE RESPIRATOR WITH ORGANIC VAPOR CARTRIDGES - FULL FACEPIECE GAS MASK WITH CHIN-STYLE CANISTER LESS THAN OR EQUAL TO 100 PPM - FULL FACEPIECE POWERED AIR-PURIFYING RESPIRATOR WITH ORGANIC VAPOR CANISTER LESS THAN OR EQUAL TO 1000 PPM - SUPPLIED-AIR RESPIRATOR WITH FULL FACEPIECE IN POSITIVE-PRESSURE MODE GREATER THAN 1000 PPM OR UNKNOWN CONCENTRATION - SELF-CONTAINED BREATHING APPARATUS WITH FULL FACEPIECE IN POSITIVE PRESSURE MODE - FULL FACEPIECE POSITIVE PRESSURE SUPPLIED-AIR RESPIRATOR WITH AUXILIARY SELF-CONTAINED AIR SUPPLY ESCAPE - ANY ORGANIC VAPOR GAS MASK - ANY SELF-CONTAINED BREATHING APPARATUS

WITH A FULL FACEPIECE FIREFIGHTING - FULL FACEPIECE SELF-CONTAINED BREATHING APPARATUS IN POSITIVE PRESSURE MODE THE FOLLOWING RESPIRATORS AND MAXIMUM USE CONCENTRATIONS ARE RECOMMENDATIONS BY THE U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES, NIOSH POCKET GUIDE TO CHEMICAL HAZARDS OR NIOSH CRITERIA DOCUMENTS.

ANY DETECTABLE CONC
- SELF-CONTAINED BREATHING APPARATUS WITH A FULL FACE-PIECE OPERATED IN PRESSURE-DEMAND OR POSITIVE-PRESSURE MODE
- SUPPLIED-AIR RESPIRATOR WITH A FULL FACEPIECE OPERATED IN PRESSURE-DEMAND OR OTHER POSITIVE PRESSURE MODE WITH AUXILIARY SELF-CONTAINED BREATHING APPARATUS OPERATED IN POSITIVE PRESSURE MODE

ESCAPE
- GAS MASK WITH AN ORGANIC VAPOR CANISTER (CHIN-STYLE OR FRONTOR BACK-MOUNTED CANISTER)
- APPROPRIATE ESCAPE-TYPE SELF-CONTAINED BREATHING APPARATUS

FIREFIGHTING
- SELF-CONTAINED BREATHING APPARATUS WITH A FULL FACE-PIECE OPERATED IN PRESSURE-DEMAND OR POSITIVE-PRESSURE MODE
- SUPPLIED-AIR RESPIRATOR WITH A FULL FACEPIECE OPERATED IN PRESSURE-DEMAND OR OTHER POSITIVE PRESSURE MODE WITH AUXILIARY SELF-CONTAINED BREATHING APPARATUS OPERATED IN POSITIVE PRESSURE MODE.

MS

MEDICAL SURVEILLANCE:
BENZENE 29CFR1910.1028(I) MEDICAL SURVEILLANCE THE OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION REQUIRES EMPLOYERS TO PROVIDE A MEDICAL SURVEILLANCE PROGRAM FOR EMPLOYEES. (1) EMPLOYEES COVERED. (A) EMPLOYEES WHO ARE OR MAY BE EXPOSED TO BENZENE AT OR ABOVE THE ACTION LEVEL 30 OR MORE DAYS PER YEAR. (B) EMPLOYEES WHO ARE OR MAY BE EXPOSED TO BENZENE AT OR ABOVE THE PELS 10 OR MORE DAYS A YEAR. (C) EMPLOYEES WHO HAVE BEEN EXPOSED TO MORE THAN 10 PPM OF BENZENE FOR 30 OR MORE DAYS IN A YEAR PRIOR TO THE EFFECTIVE DATE OF THE STANDARD. (D) EMPLOYEES INVOLVED IN THE TIRE BUILDING OPERATIONS CALLED TIRE BUILDING MACHINE OPERATORS, WHO USE SOLVENTS CONTAINING GREATER THAN 0.1 PERCENT BENZENE. (2) INITIAL EXAMINATION. (A) A DETAILED OCCUPATIONAL HISTORY WHICH INCLUDES: (1) PAST WORK EXPOSURE TO BENZENE AND OTHER HEMATOLOGICAL TOXINS; (2) A FAMILY HISTORY OF BLOOD DYSCRASIAS INCLUDING HEMATOLOGICAL NEOPLASMS; (3) A HISTORY OF BLOOD DYSCRASIAS INCLUDING GENETIC HEMOGLOBIN ABNORMALITIES, BLEEDING ABNORMALITIES, ABNORMAL FUNCTION OF FORMED BLOOD ELEMENTS; (4) A HISTORY OF RENAL OR LIVER DYSFUNCTION; (5) A HISTORY OF MEDICINAL DRUGS ROUTINELY TAKEN; (6) A HISTORY OF PREVIOUS EXPOSURE TO IONIZING RADIATION, AND (7) EXOSURE TO MARROW TOXINS OUTSIDE OF THE ORK SITUATION. (B) COMPLETE PHYSICAL EXAMINATION. (C) LABORATORY TESTS (1) A COMPLETE BLOOD COUNT INCLUDING A LEUKOCYTE COUNT WITH DIFFERENTIAL (2) QUANTITATIVE THROMBOCYTE COUNT (3) HEMATOCRIT (4) HEMOGLOBIN (5) ERYTHROCYTE COUNT (6) ERYTHROCYTE INDICES (MCV,MCH,MCHC) (D) ADDITIONAL TEST AS NECESSARY IN THE OPINION OF THE EXAMINING PHYSICIAN AND; (E) FOR ALL WORKERS REQUIRED TO WEAR RESPIRATORS AT LEAST 30 DAYS OR MORE A YEAR, THE PHYSICAL EXAM SHALL PAY SPECIAL ATTENTION TO THE CARDIOPULMONARY SYSTEM AND SHALL INCLUDE A PULMONARY FUNCTION TEST. (3) PERIODIC EXAMINATIONS. (A) THE EMPLOYER SHALL PROVIDE EACH COVERED EMPLOYEE WITH A MEDICAL EXAM ANNUALLY FOLLOWING THE PREVIOUS EXAM. THESE PERIODIC EXAMS SHALL INCLUDE AT LEAST THE FOLLOWING: (1) BRIEF HISTORY REGARDING NEW EXPOSURE TO POTENTIAL MARROW TOXINS, CHANGES IN DRUG USE AND THE APPEARANCE OF PHYSICAL SIGNS RELATING TO BLOOD DISORDERS; (2) A COMPLETE BLOOD COUNT INCLUDING A LEUKOCYTE COUNT WITH DIFFERENTIAL; (3)

QUANTITATIVE THROMBOCYTE COUNT; (4) HEMOGLOBIN; (5) HEMATOCRIT; (6) ERYTHROCYTE COUNT; (7) ERYTHROCYTE INDICES (MCV,MCH,MCHC) AND (8)APPROPRIATE ADDITIONAL TESTS AS NECESSARY, IN THE OPINION OF THE EXAMINING PHYSICIAN, IN CONSEQUENCE OF. (A) ALTERATIONS IN BLOOD COMPONENTS OR OTHER SIGNS WHICH MAY BE RELATED TO BENZENE EXPOSURE; (B) THE EMPLOYEE DEVELOPING SIGNS AND SYMPTOMS ASSOCIATED WITH BENZENE POISONING; (C) REQUIRED USE OF RESPIRATORS FOR AT LEAST 30 DAYS A YEAR, PULMONARY FUNCTION TEST SHALL BE PERFORMED EVERY 3 YEARS ALONG WITH A SPECIFIC EVALUATION OF THE CARDIOVASCULAR SYSTEM. (4) EMERGENCY EXAMINATIONS. IF AN EMPLOYEE IS EXPOSED TO BENZENE IN AN EMERGENCY SITUATION, THE EMPLOYEE SHALL PROVIDE A URINE SAMPLE AT THE END OF THE SHIFT AND HAVE A URINE PHENOL TEST PERFORMED ON THE SAMPLE WITHIN 72 HOURS. (A) IF THE RESULT OF THE TEST IS BELOW 75 MG PHENOL/L OF URINE, NO FURTHER TESTING IS REQUIRED. (B) IF THE RESULT OF THE URINARY PHENOL TEST IS EQUAL TO OR GREATER THAN 75 MG PHENOL/L OF URINE, THE EMPLOYER SHALL PROVIDE THE EMPLOYEE WITH: (1) A COMPLETE BLOOD COUNT INCLUDING AN ERYTHROCYTE COUNT; (2) A LEUKOCYTE COUNT WITH DIFFERENTIAL AND (3) A THROMBOCYTE COUNT AT MONTHLY INTERVALS FOR A DURATION OF THREE MONTHS FOLLOWING THE EMERGENCY EXPOSURE. (5) ADDITIONAL EXAMINATIONS AND REFERRALS. (A) WHERE THE COMPLETE BLOOD COUNT RESULTS INDICATE ANY OF THE FOLLOWING ABNORMAL CONDITIONS EXIST, THEN THE BLOOD COUNT SHALL BE REPEATED WITHIN TWO WEEKS. (1) IF THE HEMOGLOBIN LEVEL OR HEMATOCRIT FALLS BELOW THE NORMAL LIMIT AND/OR THESE INDICES SHOW A PERSISTENT DOWNWARD TREND FROM PRE-EXPOSURE NORMS; (2) THE THROMBOCYTE COUNT VARIES MORE THAN 20 PERCENT BELOW THE MOST RECENT VALUE OR FALLS OUTSIDE THE NORMAL LIMIT; (3) THE LEUKOCYTE COUNT IS BELOW 4,000 MM3 OR THERE IS AN ABNORMAL DIFFERENTIAL COUNT;.

(A) IF THE ABNORMALITY PERSISTS, THE PHYSICIAN SHALL REFER THE EMPLOYEE TO A HEMATOLOGIST/ INTERNIST FOR FURTHER EVALUATION UNLESS THE PHYSICIAN BELIEVES SUCH A REFERRAL IS UNNECESSARY. (B) THE EMPLOYER SHALL PROVIDE THE HEMOTOLOGIST/INTERNIST WITH ALL AVAILABLE MEDICAL RECORDS ON THE EMPLOYEE. (C) THE HEMATOLOGIST'S OR INTERNIST'S EVALUATION SHALL INCLUDE A DETERMINATION AS TO THE NEED FOR ADDITIONAL TESTS AND THE EMPLOYER SHALL ASSURE THESE TESTS ARE PROVIDED.

(6) INFORMATION PROVIDED TO THE PHYSICIAN. (A) A COPY OF THIS REGULATION AND ITS APPENDICES; (B) A DESCRIPTION OF THE AFFECTED EMPLOYEE'S DUTIES AS THEY RELATE TO EXPOSURE; (C) THE EMPLOYEE'S ACTUAL OR REPRESENTATIVE EXPOSURE LEVEL; (D) A DESCRIPTION OF ANY PERSONAL PROTECTIVE EQUIPMENT USED OR TO BE USED AND (E) INFORMATION FROM PREVIOUS EMPLOYMENT-RELATED MEDICAL EXAMS OF THE AFFECTED EMPLOYEE WHICH IS NOT OTHERWISE AVAILABLE TO THE EXAMINING PHYSICIAN. (7) PHYSICIANS WRITTEN OPINION. FOR EACH EXAM THE EMPLOYER SHALL OBTAIN AND PROVIDE THE EMPLOYEE WITH A COPY OF THE PHYSICIANS WRITTEN OPINION WITHIN 15 DAYS OF THE EXAM. THE WRITTEN OPINION SHALL BE LIMITED TO THE FOLLOWING: (A) THE OCCUPATIONALLY PERTINENT RESULTS OF THE MEDICAL EXAM AND TESTS; (B) PHYSICIANS OPINION CONCERNING WHETHER THE EMPLOYEE HAS ANY DETECTED MEDICAL CONDITIONS WHICH WOULD PLACE THE EMPLOYEE AT INCREASED RISK FROM EXPOSURE; (C) PHYSICIANS RECOMMENDED LIMITATIONS UPON THE EMPLOYEE'S EXPOSURE TO BENZENE OR UPON THE EMPLOYEE'S USE OF PROTECTIVE CLOTHING OR EQUIPMENT AND RESPIRATORS; AND (D) A STATEMENT THAT THE EMPLOYEE HAS BEEN INFORMED BY THE PHYSICIAN OF THE RESULTS OF THE EXAM AND ANY MEDICAL CONDITION RESULTING FROM BENZENE EXPOSURE WHICH REQUIRE FURTHER EXPLANATION OR TREATMENT. THIS STATEMENT SHALL NOT REVEAL SPECIFIC RECORDS, FINDINGS AND DIAGNOSES THAT HAVE NO BEARING ON THE EMPLOYEE'S ABILITY TO WORK IN A BENZENE-EXPOSED WORKPLACE. (8) MEDICAL REMOVAL PLAN. (A) WHEN AN EMPLOYEE HAS BEEN REFERRED TO A HEMATOLOGIST/INTERNIST THE EMPLOYEE SHALL BE REMOVED FROM AREAS WHERE EXPOSURES MAY EXCEED THE ACTION LEVEL UNTIL A DECISION IS MADE BY THE PHYSICIAN IN CONSULTATION WITH THE HEMATOLOGIST/INTERNIST TO

ALLOW THE EMPLOYEE TO RETURN. THIS DECISION SHALL BE GIVEN IN WRITING TO THE EMPLOYER AND EMPLOYEE. IN CASE OF REMOVAL, THE PHYSICIAN SHALL STATE THE PROBABLE DURATION OF REMOVAL AND THE REQUIREMENTS FOR FUTURE MEDICAL EXAMS TO REVIEW THE DECISION. (B) FOR ANY EMPLOYEE WHO IS REMOVED, THE EMPLOYER SHALL PROVIDE A FOLLOW-UP EXAM. WITHIN SIX MONTHS A DECISION SHALL BE MADE BY THE PHYSICIAN, IN CONSULTATION WITH THE HEMOTOLOGIST/ INTERNIST AS TO WHETHER THE EMPLOYEE SHALL BE RETURNED TO THE USUAL JOB OR SHOULD BE REMOVED PERMANENTLY. (C) IF AN EMPLOYEE IS TEMPORARILY REMOVED, THE EMPLOYER SHALL TRANSFER THE EMPLOYEE TO A COMPARABLE JOB THAT IS EXPOSED IN NO EVENT TO BENZENE LEVELS HIGHER THAN THE ACTION LEVEL. THE EMPLOYER SHALL MAINTAIN THE EMPLOYEE'S CURRENT WAGE RATE, SENIORITY AND OTHER BENEFITS. IF NO SUCH JOB IS AVAILABLE THE EMPLOYER SHALL PROVIDE MEDICAL REMOVAL PROTECTION BENEFITS UNTIL SUCH A JOB BECOMES AVAILABLE OR FOR SIX MONTHS, WHICHEVER COMES FIRST. (D) IF AN EMPLOYEE IS PERMANENTLY REMOVED FROM BENZENE EXPOSURE, THE EMPLOYEE SHALL BE GIVEN THE OPPORTUNITY TO TRANSFER TO ANOTHER POSITION WHICH IS AVAILABLE OR SHORTLY BECOMES AVAILABLE FOR WHICH THE EMPLOYEE IS QUALIFIED (OR CAN BE TRAINED FOR IN A SHORTTIME) AND WHERE BENZENE EXPOSURE IS AS LOW AS POSSIBLE - IN NO EVENT HIGHER THAN THE ACTION LEVEL. THE EMPLOYEE SHALL SUFFER NO REDUCTION IN CURRENT WAGE RATE, SENIORITY OR OTHER BENEFITS AS A RESULT OF THE TRANSFER. (9) MEDICAL REMOVAL PROTECTION BENEFITS. (A) THE EMPLOYEE SHALL RECEIVE SIX MONTHS OF MEDICAL REMOVAL PROTECTION BENEFITS IMMEDIATELY FOLLOWING EACH OCCASION AN EMPLOYEE IS REMOVED FROM EXPOSURE BECAUSE OF HEMATOLOGICAL FINDINGS UNLESS THE EMPLOYEE HAS BEEN TRANSFERRED TO A COMPARABLE JOB WHERE BENZENE EXPOSURE IS BELOW ACTION LEVEL. (B) FOR THE PURPOSES OF THIS SECTION, THE REQUIREMENT THAT AN EMPLOYER PROVIDE MEDICAL REMOVAL PROTECTION BENEFITS MEANS THAT THE EMPLOYER SHALL MAINTAIN THE WAGE RATE, SENIORITY AND OTHER BENEFITS OF AN EMPLOYEE AS THOUGH THE EMPLOYEE HAD NOT BEEN REMOVED. (C) THE EMPLOYERS OBLIGATION TO PROVIDE MEDICAL REMOVAL PROTECTION BENEFITS TO A REMOVED EMPLOYEE SHALL BE REDUCED TO THE EXTENT THAT THE EMPLOYEE RECEIVES COMPENSATION FOR LOST EARNINGS FROM A PUBLICLY OR AN EMPLOYER-FUNDED COMPENSATION PROGRAM, OR FROM EMPLOYMENT WITH ANOTHER EMPLOYER MADE POSSIBLE BY VIRTUE OF THE EMPLOYEE'S REMOVAL.
ACGIH BIOLOGICAL EXPOSURE INDICES FOR BENZENE: 50 MG/L TOTAL PHENOL IN URINE / TIMING -END OF SHIFT 0.08 PPM BENZENE IN MIXED EXHALED AIR / TIMING --PRIOR TO NEXT SHIFT 0.12 PPM BENZENE IN EXHALED AIR / TIMING -PRIOR TO NEXT SHIFT.
29CFR1910.20 OSHA STANDARD SUBPART C - GENERAL SAFETY AND HEALTH PROVISIONS PROVIDES FOR EMPLOYEE, DESIGNATED REPRESENTATIVE, AND OSHA ACCESS TO EMPLOYER-MAINTAINED EXPOSURE AND MEDICAL RECORDS RELEVANT TO EMPLOYEES EXPOSED TO TOXIC SUBSTANCES AND HARMFUL PHYSICAL AGENTS.
53FR38140 9/29/88 (AMENDED).

:E

ROUTE OF ENTRY:
INHALATION. SKIN ABSORPTION. INGESTION. SKIN OR EYE CONTACT.

:O

TARGET ORGANS:
BLOOD. CENTRAL NERVOUS SYSTEM. SKIN. BONE MARROW. EYES. RESPIRATORY SYSTEM.

:P

SYMPTOMS:
SKIN, COVERING OF BODY (SC0174);
IRRITATION, EXTREME REACTION TO A CONDITION (SC0090).
EYE, ORGAN OF SIGHT (SC0170);
IRRITATION, EXTREME REACTION TO A CONDITION (SC0090).
MUCOUS MEMBRANE, MEMBRANE LINING PASSAGES/CAVITIES (SC0109);
IRRITATION, EXTREME REACTION TO A CONDITION (SC0090). NAUSEA, SICKNESS

AT THE STOMACH (SC0115). VOMITING, PERTAINING TO NAUSEA (SC0166). HEADACHE, PAIN IN HEAD OR CRANIUM AREA (SC0075). DIZZINESS, FEELING FAINT, LIGHT-HEADED, UNSTEADY(SC0048). DROWSINESS, FALLING ASLEEP (SC0049). WEAKNESS, LACK OF STRENGTH (SC0167). EUPHORIA, AN EXAGGERATED FEELING OF WELL-BEING (SC0061). IRRITABILITY, QUICK EXCITABILITY TO ANNOYANCE (SC0091). MALAISE, UNEASINESS, DISCOMFORT, FEELING BAD (SC0106). CONFUSION, IN A BEWILDERED STATE (SC0030). ATAXIA, MUSCULAR INCOORDINATION (SC0013). INCOORDINATION, LACK OF COORDINATION (SC0085).
CHEST, THE THORAX (SC0754);
PAIN, SUFFERING, EITHER PHYSICAL OR MENTAL (SC0182). DYSPNEA, DIFFICULTY IN BREATHING (SC0052). PALLOR, PALENESS, AS OF THE SKIN (SC0122).
CYANOSIS, DARK BLUE/PURPLE SKIN COLOR (SC0038). TINNITUS, RINGING IN EARS (SC0308). BLURRED VISION, (SC0015). DELIRIUM, STATE OF DISORIENTATION, CONFUSION (SC0288).
CARDIAC, PERTAINING TO HEART (SC0023);
ARRHYTHMIA, ABSENCE OF RHYTHM; IRREGULARITY (SC0010). ANESTHESIA, LOSS OF SENSATION (SC0005). PARALYSIS, LOSS OF POWER OF VOLUNTARY MOVEMENT (SC0124). TREMORS, TREMBLING, SHAKING (SC0197). CONVULSIONS, SUDDEN MUSCLE CONTRACTIONS (SC0034). POLYNEURITIS, INFLAMMATION OF MANY NERVES (SC0624). ANOREXIA, DIMINISHED APPETITE (SC0006). INSOMNIA, INABILITY TO OBTAIN NORMAL SLEEP (SC0088). AGITATION, JERKING OF ARMS (SC0003).
ERYTHEMA, REDNESS, SPOTS ON SKIN (SC0060). APLASTIC ANEMIA, ANEMIA FROM BONE MARROW DAMAGE (SC0285). ASPHYXIA, SUFFOCATION (SC0011).
CENTRAL NERVOUS SYSTEM, PERTAINING TO NEURAL BODY SYSTEM (SC0028);
DEPRESSION, DECREASE IN ACTIVITY/FUNCTION (SC0043). VENTRICULAR FIBRILLATION, RAPID CONTRACTIONS OF VENTRICLES (SC0162). FATIGUE, TIREDNESS, SLUGGISH (SC0066). FEVER, BODY TEMPERATURE ABOVE NORMAL (SC0067). HYPOTENSION, LOW BLOOD PRESSURE (SC0180). TACHYCARDIA, ABNORMAL RAPID HEARTBEAT (SC0158).
CEREBRAL, PERTAINING TO CEREBRUM (BRAIN) (SC0024);
ATROPHY, WASTING FROM MALNUTRITION (SC0196). BLOOD CHANGES, CHANGES IN BLOOD CELLS OR MORPHOLOGY (SC0227). BRUISE, IMPACT INJURY WITHOUT LACERATION (SC0779). HEMOLYSIS, BLOOD DISSOLUTION, DESTRUCTION (SC0195).
LEUKEMIA, CANCER OF BLOOD CELL PRODUCTION (SC0100).
CARCINOMA, MALIGNANT CANCEROUS GROWTH (SC0365);
IN EXPERIMENTAL ANIMALS, (SC0212). MENSTRUAL DISORDERS, DISTURBANCE IN MENSES (SC0752).
REPRODUCTIVE EFFECTS, BIRTH DEFECTS (SC0281);
IN EXPERIMENTAL ANIMALS, (SC0212).
RESPIRATORY, PERTAINING TO THE LUNGS (SC0142);
FAILURE, LOSS OF FUNCTION (SC0386).
CIRCULATORY, PERTAINING TO CIRCULATION (SC0613);
COLLAPSE, EXTREME PROSTRATION (SC0029).

A

FIRST AID.

(1 OF 5)
IF THIS CHEMICAL GETS INTO THE EYES, WASH THE EYES IMMEDIATELY WITH LARGE AMOUNTS OF WATER OR NORMAL SALINE, OCCASIONALLY LIFTING UPPER AND LOWER LIDS, UNTIL NO EVIDENCE OF CHEMICAL REMAINS (APPROXIMATELY 15-20 MINUTES). GET MEDICAL ATTENTION IMMEDIATELY.

(2 OF 5)
IF THIS CHEMICAL GETS ON THE SKIN, REMOVE CONTAMINATED CLOTHING AND SHOES IMMEDIATELY. WASH AFFECTED AREA WITH SOAP OR MILD DETERGENT AND LARGE AMOUNTS OF WATER UNTIL NO EVIDENCE OF CHEMICAL REMAINS (APPROXIMATELY 15-20 MINUTES). GET MEDICAL ATTENTION IMMEDIATELY.

OF POISONING, 12TH ED.).

3

AN ACCESSION NUMBER: 265. 9112.
CN CHEMICAL NAME: ASBESTOS.
SY SYNONYMS: CHRYSOTILE. CROCIDOLITE. ACTINOLITE. AMOSITE. ANTHOPHYLLITE. TREMOLITE. STCC 4945705. UN 2212. UN 2590.
RN CAS NUMBER: 1332-21-4.

REG. TOXIC NUMBER: CI6475000.

CHEMICAL FORMULA: VARIES.

PD
PHYSICAL DESCRIPTION:
FIBERS OR FILAMENTS WHICH MAY BE WHITE, BLUE, BROWN, GRAY, GREEN OR YELLOW IN COLOR.

MOL WT:	VARIES
BOILING PT:	NOT AVAILABLE
SOLUBILITY:	INSOLUBLE
FLASH PT:	NONCOMBUSTIBLE SOLID
VAPOR PRES:	NOT AVAILABLE
MELT PT:	>1832 F (>1000 C)
UEL IN AIR:	NONFLAMMABLE
LEL IN AIR:	NONFLAMMABLE
MEC IN AIR:	
SPEC GRAVITY:	2.4-3.3
VAPOR DENSITY:	
ODOR THRESHOLD:	
OCTANOL/WATER CO-EFFICIENT:.	

EL
PERMISSABLE EXPOSURE:
0.2 FIBER(>5 MICRONS IN LENGTH)/CC OSHA TWA (ALL FORMS)

0.1 FIBER (>5 MICRONS IN LENGTH)/CC OSHA ACTION LEVEL (ALL FORMS)
1 FIBER (>5 MICRONS IN LENGTH)/CC OSHA EXCURSION LIMIT
0.5 FIBER(>5 MICRONS IN LENGTH)/CC ACGIH TWA (AMOSITE)
2 FIBERS(>5 MICRONS IN LENGTH)/CC ACGIH TWA (CHRYSOTILE)
0.2 FIBER(>5 MICRONS IN LENGTH)/CC ACGIH TWA (CROCIDOLITE)
2 FIBERS(>5 MICRONS IN LENGTH)/CC ACGIH TWA (OTHER FORMS)
0.1 FIBER(>5 MICRONS IN LENGTH)/CC NIOSH REC 8 HOUR TWA (ALL FORMS)
0.5 FIBER(>5 MICRONS IN LENGTH)/CC NIOSH REC 15 MIN CEILING (ALL FORMS)
0.2 F/CC ACGIH TWA (NOTICE OF INTENDED CHANGES 1991-1992)
TUMORIGENIC DATA (RTECS); MUTAGENIC DATA (RTECS)
CERCLA HAZARD RATINGS - TOXICITY 3 - IGNITABILITY 0 - REACTIVITY 0 - PERSISTENCE 3
OSHA CARCINOGEN; KNOWN HUMAN CARCINOGEN (NTP)
ACGIH A1-CONFIRMED HUMAN CARCINOGEN
HUMAN SUFFICIENT EVIDENCE FOR CARCINOGENICITY (IARC GROUP-1)
ANIMAL SUFFICIENT EVIDENCE FOR CARCINOGENICITY (IARC GROUP-1)
ACGIH A1-CONFIRMED HUMAN CARCINOGEN (NOTICE OF INTENDED CHANGES 91-92)
TOXICOLOGY: ASBESTOS MAY BE IRRITATING TO THE EYES, SKIN AND MUCOUS MEMBRANES. THERE IS INSUFFICIENT DATA TO QUANTIFY THE TOXICITY. POISONING MAY AFFECT THE LUNGS. REPEATED OR PROLONGED EXPOSURE TO ASBESTOS MAY CAUSE ASBESTOSIS, AN INTERSTITIAL FIBROSIS OF THE LUNG TISSUE WHICH MAY DEVELOP FULLY WITHIN 7-9 YEARS, BUT ONSET IS TYPICALLY DELAYED 20-40 YEARS AFTER THE FIRST EXPOSURE. THE INITIAL SYMPTOM IS A PROGRESSIVE EXERTIONAL DYSPNEA. OCCUPATIONAL EXPOSURE TO CHRYSOTILE, AMOSITE, MIXTURES CONTAINING CROCIDOLITE, AND OTHER FORMS OF ASBESTOS HAS RESULTED IN A HIGH INCIDENCE OF LUNG CANCER AND PLEURAL AND PERITONEAL MESOTHELIOMAS. GASTROINTESTINAL CANCERS WERE INCREASED IN WORKERS EXPOSED TO AMOSITE, CHRYSOTILE, OR MIXED FIBERS CONTAINING CROCIDOLITE. THE LATENT PERIOD FOR MESOTHELIOMAS IS 3.5-30 YEARS; FOR LUNG CANCER, 15-30 YEARS.
THE THRESHOLD LIMIT VALUE WAS ESTABLISHED BASED ON HEALTH EFFECTS DATA.
SMOKING ENHANCES THE RISK OF LUNG CANCER.
IHL-HMN TCLO: 1.2 FIBERS/CC/19 YRS-C

OSHA STANDARD 1910.1200 HAZARD COMMUNICATION REQUIRES CHEMICAL MANUFACTURERS AND IMPORTERS TO ASSESS THE HAZARDS OF CHEMICALS WHICH THEY PRODUCE OR IMPORT, AND ALL EMPLOYERS TO PROVIDE INFORMATION TO THEIR EMPLOYEES CONCERNING HAZARDOUS CHEMICALS BY MEANS OF A HAZARD COMMUNICATION PROGRAM, LABELS AND OTHER FORMS OF WARNING, MATERIAL SAFETY DATA SHEETS, AND INFORMATION AND TRAINING. REQUIRES DISTRIBUTORS TO TRANSMIT REQUIRED INFORMATION TO EMPLOYEES.

DANGEROUS EXPOSURE:
  POTENTIAL CARCINOGENNIOSH
FIBERS OR FILAMENTS WHICH MAY.

[C

INCOMPATIBILITIES:
HYDROFLUORIC ACID.

[L

  CLOTHING:
29CFR1910.1001(H) ASBESTOS THE EMPLOYER SHALL PROVIDE FOR THE EMPLOYEE, IF EXPOSED TO ASBESTOS ABOVE THE PERMISSIBLE EXPOSURE LIMIT OR IF THE POSSIBILITY OF EYE IRRITATION EXISTS, APPROPRIATE PROTECTIVE WORK CLOTHING AND EQUIPMENT SUCH AS COVERALLS OR SIMILAR FULL-BODY WORK CLOTHING, FACESHIELDS, VENTED GOGGLES OR OTHER APPROPRIATE PROTECTIVE EQUIPMENT WHICH COMPLIES WITH 29CFR1910.133.
EMPLOYERS SHALL ENSURE THAT CLOTHING WHICH HAS HAD ANY POSSIBILITY OF

BEING CONTAMINATED WITH THIS SUBSTANCE IS PLACED IN CLOSED CONTAINERS FOR STORAGE UNTIL IT CAN BE DISCARDED OR UNTIL THE EMPLOYER PROVIDES FOR THE REMOVAL OF THE CONTAMINANT FROM THE CLOTHING. IF THE CLOTHING IS TO BE LAUNDERED OR OTHERWISE CLEANED TO REMOVE THE CONTAMINANT, THE EMPLOYER SHALL INFORM THE PERSON PERFORMING THE OPERATION OF THE HAZARDOUS PROPERTIES OF THE SUBSTANCE.

'WEAR EYE PROTECTION TO PREVENT:
29CFR1910.1001(H) ASBESTOS THE EMPLOYER SHALL PROVIDE, WHERE THERE IS ANY POSSIBILITY OF EYE IRRITATION FROM ASBESTOS OCCURRING, FACESHIELDS, VENTED GOGGLES OR OTHER APPROPRIATE PROTECTIVE EQUIPMENT WHICH COMPLIES WITH 29CFR 1910.133.

EMPLOYEE SHOULD WASH:
29CFR1910.1001(H) ASBESTOS THE EMPLOYER SHALL ENSURE THAT EMPLOYEES WHO WORK IN AREAS WHERE THE AIRBORNE EXPOSURE IS ABOVE THE PERMISSIBLE EXPOSURE LIMIT TO SHOWER AT THE END OF EACH WORK SHIFT. THE EMPLOYER SHALL ENSURE THAT EMPLOYEES WHO HANDLE THIS SUBSTANCE WASH THEIR HANDS AND FACES PRIOR TO EATING, DRINKING OR SMOKING.
FOLLOWING INFORMATION FROM NIOSH/OSHA "OCCUPATIONAL HEALTH GUIDELINES FOR CHEMICAL HAZARDS":
EMPLOYERS SHALL ENSURE THAT EMPLOYEES WHOSE SKIN BECOMES CONTAMINATED WITH THIS SUBSTANCE PROMPTLY WASH OR SHOWER WITH SOAP OR MILD DETERGENT AND WATER TO REMOVE ANY CONTAMINANT FROM THE SKIN.

WORK CLOTHING SHOULD BE CHANGED DAILY:
29CFR1910.1001(H) ASBESTOS THE EMPLOYER SHALL PROVIDE CLEAN CHANGE ROOMS FOR EMPLOYEES WHO WORK IN AREA WHERE THEIR AIRBORNE EXPOSURE TO ASBESTOS IS ABOVE THE PERMISSIBLE EXPOSURE LIMIT. THE EMPLOYER SHALL ENSURE THAT CHANGE ROOMS ARE IN ACCORDANCE WITH 29CFR1910.141(E) AND ARE EQUIPPED WITH TWO SEPERATE LOCKERS OR STORAGE FACILITIES, SO SEPERATED AS TO PREVENT CONTAMINATION OF THE EMPLOYEE'S STREET CLOTHES FROM HIS PROTECTIVE WORK CLOTHING AND EQUIPMENT.
FOLLOWING INFORMATION FROM NIOSH/OSHA "OCCUPATIONAL HEALTH GUIDELINES FOR CHEMICAL HAZARDS":
EMPLOYERS SHALL ENSURE THAT EMPLOYEES WHOSE CLOTHING MAY HAVE BECOME CONTAMINATED WITH THIS SUBSTANCE CHANGE INTO UNCONTAMINATED CLOTHING BEFORE LEAVING THE WORK PREMISES.

REMOVE CLOTHING:
29CFR1910.1001(H) ASBESTOS THE EMPLOYER SHALL ENSURE THAT EMPLOYEES REMOVE WORK CLOTHING CONTAMINATED WITH ASBESTOS ONLY IN CHANGE ROOMS PROVIDED. THE EMPLOYER SHALL ENSURE THAT NO EMPLOYEE TAKES CONTAMINATED WORK CLOTHING OUT OF THE CHANGE ROOM, EXCEPT THOSE EMPLOYEES AUTHORIZED TO DO SO FOR THE PURPOSE OF LAUNDERING, MAINTENANCE OR DISPOSAL.

THE FOLLOWING EQUIPMENT SHOULD BE AVAILABLE:
29CFR1910.1001(H) ASBESTOS WARNING SIGNS SHALL BE PROVIDED AND DISPLAYED AT EACH REGULATED AREA. IN ADDITION, WARNING SIGNS SHALL BE POSTED AT ALL APPROACHES TO REGULATED AREAS SO THAT AN EMPLOYEE MAY READ THE SIGNS AND TAKE NECESSARY PROTECTIVE STEPS BEFORE ENTERING THE AREA. THE WARNING SIGNS SHALL BEAR THE FOLLOWING INFORMATION: DANGER ASBESTOS CANCER AND LUNG DISEASE HAZARD AUTHORIZED PERSONNEL ONLY RESPIRATORS AND PROTECTIVE CLOTHING ARE REQUIRED IN THIS AREA WARNING LABELS SHALL BE AFFIXED TO ALL RAW MATERIALS, MIXTURES, SCRAP, WASTE, DEBRIS AND OTHER PRODUCTS CONTAINING ASBESTOS AND CONTAIN THE FOLLOWING INFORMATION: DANGER CONTAINS ASBESTOS FIBERS AVOID CREATING DUST CANCER AND LUNG DISEASE HAZARD.

RP

RESPIRATOR SELECTION (UPPER LIMIT DEVICES PERMITTED):
ASBESTOS

THE FOLLOWING RESPIRATORS ARE THE MINIMUM LEGAL REQUIREMENTS AS SET FORTH BY THE OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION FOUND IN 29CFR1910, SUBPART Z NOT IN EXCESS OF 2 FIBERS/CC TWA - HALF-MASK AIR-PURIFYING RESPIRATOR EQUIPPED WITH HIGH-EFFICIENCY FILTERS NOT IN EXCESS OF 10 FIBERS/CC TWA - FULL FACEPIECE AIR-PURIFYING RESPIRATOR EQUIPPED WITH HIGH-EFFICIENCY FILTERS NOT IN EXCESS OF 20 FIBERS/CC TWA - ANY POWERED AIR-PURIFYING RESPIRATOR EQUIPPED WITH HIGH-EFFICIENCY FILTERS - ANY SUPPLIED-AIR RESPIRATOR OPERATED IN CONTINUOUS FLOW MODE NOT IN EXCESS OF 200 FIBERS/CC TWA - FULL FACEPIECE SUPPLIED-AIR RESPIRATOR OPERATED IN PRESSURE DEMAND MODE GREATER THAN 200 FIBERS/CC TWA OR UNKNOWN CONCENTRATION - FULL FACEPIECE SUPPLIED-AIR RESPIRATOR OPERATED IN PRESSURE DEMAND MODE AND EQUIPPED WITH AN AUXILIARY POSITIVE PRESSURE SELF-CONTAINED BREATHING APPARATUS NOTE: RESPIRATORS ASSIGNED FOR HIGHER ENVIRONMENTAL CONCENTRATIONS MAY BE USED AT LOWER CONCENTRATIONS. THE FOLLOWING RESPIRATORS AND MAXIMUM USE CONCENTRATIONS ARE RECOMMENDATIONS BY THE U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES, NIOSH POCKET GUIDE TO CHEMICAL HAZARDS OR NIOSH CRITERIA DOCUMENTS.

ANY DETECTABLE CONC

- SUPPLIED-AIR RESPIRATOR WITH A FULL FACEPIECE OPERATED IN PRESSURE-DEMAND OR OTHER POSITIVE PRESSURE MODE WITH AUXILIARY SELF-CONTAINED BREATHING APPARATUS OPERATED IN POSITIVE PRESSURE MODE
- SELF-CONTAINED BREATHING APPARATUS WITH A FULL FACE-PIECE OPERATED IN PRESSURE-DEMAND OR POSITIVE-PRESSURE MODE

ESCAPE

- AIR-PURIFYING FULL FACEPIECE RESPIRATOR WITH A HIGH-EFFICIENCY PARTICULATE FILTER
- APPROPRIATE ESCAPE-TYPE SELF-CONTAINED BREATHING APPARATUS

FIREFIGHTING

- SELF-CONTAINED BREATHING APPARATUS WITH A FULL FACE-PIECE OPERATED IN PRESSURE-DEMAND OR POSITIVE-PRESSURE MODE.

MS

MEDICAL SURVEILLANCE:
29CFR1910.1001 THE OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION REQUIRES EMPLOYERS TO PROVIDE A MEDICAL SURVEILLANCE PROGRAM FOR ALL EMPLOYEES WHO ARE OR WILL BE EXPOSED TO AIRBORNE CONCENTRATIONS OF FIBERS OF ASBESTOS, TREMOLITE, ANTHOPHYLLITE, ACTINOLITE, OR A COMBINATION OF THE MINERALS AT OR ABOVE THE ACTION LEVEL. THIS MEDICAL SURVEILLANCE PROGRAM SHALL CONSIST OF: (1) INITIAL (PRE-PLACEMENT) MEDICAL EXAMINATION INCLUDING: (A) MEDICAL AND WORK HISTORY (B) COMPLETE PHYSICAL EXAMINATION BY A LICENSED PHYSICIAN WITH EMPHASIS ON: (1) RESPIRATORY SYSTEM (2) CARDIOVASCULAR SYSTEM (3) DIGESTIVE TRACT (C) COMPLETION OF THE RESPIRATORY DISEASE STANDARDIZED QUESTIONNAIRE (D) CHEST ROENTGENOGRAM (P.A. OR 14" X 17") (E) PULMONARY FUNCTION TESTS INCLUDING: (1) FORCED VITAL CAPACITY (2) FORCED EXPIRATORY VOLUME (F) ADDITIONAL EXAMS DEEMED APPROPRIATE BY THE EXAMINING PHYSICIAN (2) PERIODIC EXAMINATIONS (A) ANNUAL EXAMS FOR ALL EMPLOYEES INCLUDING ALL THE TESTS IN THE INITIAL EXAM EXCEPT THE FREQUENCY OF THE CHEST ROENTGENOGRAM (B) ABBREVIATED STANDARDIZED RESPIRATORY QUESTIONNAIRE (C) CHEST ROENTGENOGRAM SHALL BE CONDUCTED IN ACCORDANCE WITH THE FOLLOWING TABLE: FREQUENCY OF CHEST ROENTGENOGRAM: AGE OF EMPLOYEE: YEARS SINCE FIRST EXPOSURE:

---:: 15-35: 35+ - 45: 45+:

0-10 YEARS: EVERY 5 YRS: EVERY 5 YRS: EVERY 5 YRS:

10+: EVERY 5 YRS: EVERY 2 YRS: EVERY 1 YR:
---(3)
TERMINATION OF EMPLOYMENT EXAM - AVAILABLE UPON TERMINATION OF EMPLOYMENT GIVEN TO THE EMPLOYEE WITHIN 30 CALENDER DAYS BEFORE OR AFTER THE DATE OF TERMINATION OF EMPLOYMENT AND INCLUDING THE REQUIREMENTS OF THE PERIODIC EXAMINATION LISTED ABOVE.
OTHER MEDICAL SURVEILLANCE RECOMMENDED: 40CFR717 RECORDS AND REPORTS OF ALLEGATIONS THAT CHEMICAL SUBSTANCES CAUSE SIGNIFICANT ADVERSE REACTIONS TO HEALTH OR THE ENVIRONMENT TOXIC SUBSTANCES CONTROL ACT (TSCA) SECTION 8(C) RULE REQUIRES MANUFACTURERS AND CERTAIN PROCESSORS OF CHEMICAL SUBSTANCES AND MIXTURES TO KEEP RECORDS OF SIGNIFICANT ADVERSE REACTIONS TO EMPLOYEE HEALTH FOR 30 YEARS.
ATTENTION TO SMOKING, ALCOHOL, MEDICATION, AND EXPOSURE TO CARCINOGENS.
MEDICAL WARNING FOR REFUSAL OF MEDICAL EXAMINATION.
SPUTUM CYTOLOGY.
29CFR1910.20 OSHA STANDARD SUBPART C - GENERAL SAFETY AND HEALTH PROVISIONS PROVIDES FOR EMPLOYEE, DESIGNATED REPRESENTATIVE, AND OSHA ACCESS TO EMPLOYER-MAINTAINED EXPOSURE AND MEDICAL RECORDS RELEVANT TO EMPLOYEES EXPOSED TO TOXIC SUBSTANCES AND HARMFUL PHYSICAL AGENTS.
53FR38140 9/29/88 (AMENDED).

RE

ROUTE OF ENTRY:
INHALATION. INGESTION. SKIN OR EYE CONTACT.

TO

TARGET ORGANS:
LUNGS. RESPIRATORY SYSTEM. GASTROINTESTINAL. SKIN.

SP

SYMPTOMS:
EYE, ORGAN OF SIGHT (SC0170);
IRRITATION, EXTREME REACTION TO A CONDITION (SC0090).
SKIN, COVERING OF BODY (SC0174);
IRRITATION, EXTREME REACTION TO A CONDITION (SC0090).
MUCOUS MEMBRANE, MEMBRANE LINING PASSAGES/CAVITIES (SC0109);
IRRITATION, EXTREME REACTION TO A CONDITION (SC0090). COUGHING, FORCEFUL EXPIRATION (SC0173).
CHEST, THE THORAX (SC0754);
PAIN, SUFFERING, EITHER PHYSICAL OR MENTAL (SC0182).
LUNG, RESPIRATORY ORGAN (SC0377);
FIBROSIS, FIBROUS SCARS (SC0064). DYSPNEA, DIFFICULTY IN BREATHING (SC0052). DECREASED VITAL CAPACITY, DECREASED PULMONARY FUNCTION (SC0546). TACHYPNEA, RAPID RESPIRATION (SC0384). PULMONARY RALES, ABNORMAL RESPIRATORY SOUNDS (SC0206). CYANOSIS, DARK BLUE/PURPLE SKIN COLOR (SC0038). ANOREXIA, DIMINISHED APPETITE (SC0006). WEAKNESS, LACK OF STRENGTH (SC0167). WEIGHT LOSS, DROP IN BODY WEIGHT (SC0104). FINGER CLUBBING, ROUNDED ENDS AND SWOLLEN FINGERS (SC0245). FATIGUE, TIREDNESS, SLUGGISH (SC0066). DERMATITIS, INFLAMMATION OF SKIN (SC0044).
CONJUNCTIVITIS, INFLAMMATION OF EYES (SC0031).
GASTROINTESTINAL, PERTAINING TO STOMACH & INTESTINE (SC0070);
IRRITATION, EXTREME REACTION TO A CONDITION (SC0090).
PLEURAL, LINING OF THORACIC CAVIVITY (SC0759);
MESOTHELIOMA, CANCER OF PLEURA (SC0260).
UREMIA, NITROGEN IN BLOOD FROM RENAL FAILURE (SC0310);
MESOTHELIOMA, CANCER OF PLEURA (SC0260).
LUNG, RESPIRATORY ORGAN (SC0377);
CANCER, MALIGNANT TUMOR OR NEOPLASM (SC0020).
GASTROINTESTINAL, PERTAINING TO STOMACH & INTESTINE (SC0070);

CANCER, MALIGNANT TUMOR OR NEOPLASM (SC0020).
LARYNX, VOICE ORGAN (SC0256);
CANCER, MALIGNANT TUMOR OR NEOPLASM (SC0020).

FA
FIRST AID.

(1 OF 4)
IF THIS CHEMICAL GETS INTO THE EYES, WASH THE EYES IMMEDIATELY WITH LARGE AMOUNTS OF WATER OR NORMAL SALINE, OCCASIONALLY LIFTING UPPER AND LOWER LIDS, UNTIL NO EVIDENCE OF CHEMICAL REMAINS (APPROXIMATELY 15-20 MINUTES). GET MEDICAL ATTENTION IMMEDIATELY.

(2 OF 4)
IF THIS CHEMICAL GETS ON THE SKIN, REMOVE CONTAMINATED CLOTHING AND SHOES IMMEDIATELY. WASH AFFECTED AREA WITH SOAP OR MILD DETERGENT AND LARGE AMOUNTS OF WATER UNTIL NO EVIDENCE OF CHEMICAL REMAINS (APPROXIMATELY 15-20 MINUTES). GET MEDICAL ATTENTION IMMEDIATELY.

(3 OF 4)
IF THIS CHEMICAL HAS BEEN INHALED, REMOVE FROM EXPOSURE AREA TO FRESH AIR IMMEDIATELY. IF BREATHING HAS STOPPED, PERFORM ARTIFICIAL RESPIRATION. KEEP PERSON WARM AND AT REST. TREAT SYMPTOMATICALLY AND SUPPORTIVELY. GET MEDICAL ATTENTION IMMEDIATELY.

(4 OF 4)
IF THIS CHEMICAL IS INGESTED, TREAT SYMPTOMATICALLY AND SUPPORTIVELY. GET MEDICAL ATTENTION IMMEDIATELY. IF VOMITING OCCURS, KEEP HEAD LOWER THAN HIPS TO PREVENT ASPIRATION.

AN ACCESSION NUMBER: 3305. 9112.
CN CHEMICAL NAME: XYLENE.
SY SYNONYMS: DIMETHYLBENZENE. BENZENE, DIMETHYL-. XYLOL. DILAN.
NCI-C55232. UN 1307. STCC 4904350. RCRA U239.
RN CAS NUMBER: 1330-20-7.

REG. TOXIC NUMBER: ZE2100000.

CHEMICAL FORMULA: C8H10.
PD
PHYSICAL DESCRIPTION:
LIGHT-COLORED OR COLORLESS, MOBILE LIQUID WITH AN AROMATIC ODOR.

MOL WT:	106.16
BOILING PT:	280-291 F (138-144C)
SOLUBILITY:	0.00003%
FLASH PT:	81-90 F (27-32 C)
VAPOR PRES:	7-9 MMHG
MELT PT:	-54-55 F (-48-13 C)
UEL IN AIR:	7%
LEL IN AIR:	1.0%
MEC IN AIR:	867-984 F (464-529C)
SPEC GRAVITY:	0.86

C:\PCPLUS\97800 01/31/92

VAPOR DENSITY: 3.7
ODOR THRESHOLD: 0.5 PPM
OCTANOL/WATER CO-EFFICIENT:.

EL

PERMISSABLE EXPOSURE:
100 PPM OSHA TWA; 150 PPM OSHA STEL
100 PPM ACGIH TWA
150 PPM ACGIH STEL
100 PPM NIOSH RECOMMENDED TWA
150 PPM NIOSH RECOMMENDED STEL
REPRODUCTIVE EFFECTS DATA (RTECS)
AQUATIC TOXICITY RATING 2 (TLM96 10 - 100 PPM)
TLM96 - BLUEGILL 20.87 PPM, FATHEAD 26.7-28.77 PPM, GUPPIES 34.37 PPM
KILL, 1HR - LEPOMIS HUMILIS 47.48 PPM
TLM24 DAPHNIA MAGNA >100 - <1000 PPM
CERCLA HAZARD RATINGS - TOXICITY 2 - IGNITABILITY 3 - REACTIVITY 0 -
PERSISTENCE 1
TOXICOLOGY: XYLENE IS AN EYE, SKIN AND MUCOUS MEMBRANE IRRITANT. IT
IS MODERATELY TOXIC BY INHALATION AND INGESTION. IT IS A CENTRAL
NERVOUS SYSTEM DEPRESSANT. POISONING MAY AFFECT THE LIVER AND KIDNEYS.
CONCENTRATIONS OF 200 PPM MAY RESULT IN IRRITATION OF THE UPPER
RESPIRATORY TRACT. INITIALLY, CENTRAL NERVOUS SYSTEM EXCITATION MAY
OCCUR FOLLOWED BY DEPRESSION WITH TRANSIENT EUPHORIA, EMOTIONAL
INSTABILITY, DROWSINESS AND ATAXIA. A GROUP OF SUBJECTS WHO INHALED
12.3 UMOL/L OF XYLENE WHILE EXERCISING BECAME SIGNIFICANTLY IMPAIRED
ON 3 NEUROPSYCHOLOGICAL TESTS. PROLONGED EXPOSURE TO VAPORS ABOVE
200 PPM MAY LEAD TO NAUSEA, VOMITING, ABDOMINAL PAIN AND ANOREXIA.
WOMEN MAY DEVELOP MENSTRUAL DISORDERS, INFERTILITY AND PATHOLOGICAL
PREGNANCY CONDITIONS.
PREGNANT WOMEN MAY BE AT AN INCREASED RISK FROM EXPOSURE.
ALCOHOLIC BEVERAGES MAY ENHANCE THE TOXIC EFFECTS. STIMULANTS SUCH
AS EPINEPHRINE OR EPHEDRINE MAY INCUDE VENTRICULAR FIBRILLATION.
IHL-MAN LCLO: 10,000 PPM/6 HR IHL-HMN TCLO: 200 PPM
ORL-HMN LDLO: 50 MG/KG ORL-RAT LD50: 4300 MG/KG
IHL-RAT LD50: 5000 PPM/4 HR SCU-RAT LD50: 1700 MG/KG
IPR-RAT LD50: 2459 MG/KG IPR-MUS LD50: 1548 MG/KG
SKIN AND EYE IRRITATION DATA (RTECS)
EYE-HMN 200 PPM SKN-RBT 100% MOD
SKN-RBT 500 MG/24 HR MOD EYE-RBT 87 MG MLD

OSHA STANDARD 1910.1200 HAZARD COMMUNICATION REQUIRES CHEMICAL
MANUFACTURERS AND IMPORTERS TO ASSESS THE HAZARDS OF CHEMICALS WHICH THEY
PRODUCE OR IMPORT, AND ALL EMPLOYERS TO PROVIDE INFORMATION TO THEIR
EMPLOYEES CONCERNING HAZARDOUS CHEMICALS BY MEANS OF A HAZARD
COMMUNICATION PROGRAM, LABELS AND OTHER FORMS OF WARNING, MATERIAL SAFETY
DATA SHEETS, AND INFORMATION AND TRAINING. REQUIRES DISTRIBUTORS TO
TRANSMIT REQUIRED INFORMATION TO EMPLOYEES.

DANGEROUS EXPOSURE:
1000 PPM OSHA/NIOSH
LIGHT-COLORED OR COLORLESS, MO.

IC

INCOMPATIBILITIES:
NITRIC ACID. STRONG OXIDIZERS. PLASTICS. RUBBER. HYDROGEN SULFIDE.
VAPOR-AIR MIXTURES ARE EXPLOSIVE ABOVE FLASH POINT!.

CL

CLOTHING:
FOLLOWING INFORMATION FROM NIOSH/OSHA "OCCUPATIONAL HEALTH GUIDELINES FOR

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CHEMICAL HAZARDS":
EMPLOYERS SHALL PROVIDE AND ENSURE THAT EMPLOYEES USE APPROPRIATE PROTECTIVE CLOTHING AND EQUIPMENT NECESSARY TO PREVENT REPEATED OR PROLONGED SKIN CONTACT WITH THIS SUBSTANCE. FACE SHIELDS SHALL COMPLY WITH 29CFR1910.133(A)(2), (A)(4), (A)(5), AND (A)(6).
EMPLOYERS SHALL ENSURE THAT CLOTHING CONTAMINATED WITH THIS SUBSTANCE IS PLACED IN CLOSED CONTAINERS FOR STORAGE UNTIL IT CAN BE DISCARDED OR UNTIL THE EMPLOYER PROVIDES FOR THE REMOVAL OF THE CONTAMINANT FROM THE CLOTHING. IF THE CLOTHING IS TO BE LAUNDERED OR OTHERWISE CLEANED TO REMOVE THE CONTAMINANT, THE EMPLOYER SHALL INFORM THE PERSON PERFORMING THE CLEANING OF THE HAZARDOUS PROPERTIES OF THE SUBSTANCE.
-ACGIH "GUIDELINES FOR THE SELECTION OF CHEMICAL PROTECTIVE CLOTHING" INDICATED THE FOLLOWING PROTECTIVE RATINGS FOR MATERIALS COMMONLY USED FOR PROTECTIVE CLOTHING. THESE RATINGS ARE BASED PRIMARILY ON QUANTITATIVE TEST RESULTS AND QUALITATIVE RESISTANCE INFORMATION. (THE RECOMMENDATIONS APPLY TO THE PURE SUBSTANCE ONLY; BREAKTHROUGH-TIME MAY VARY FOR MIXTURES.) (A "+" DESIGNATES A BLEND OF MATERIALS, WHILE A "/" DESIGNATES A COATED OR LAMINATED MATERIAL.) -
XYLENE: EXCELLENT/GOOD: POLYVINYL ALCOHOL GOOD/FAIR: VITON/NEOPRENE VITON TEFLON POOR/FAIR: BUTYL CHLORINATED POLYETHYLENE BUTYL/NEOPRENE STYRENE-BUTADIENE RUBBER POOR: NATURAL RUBBER NEOPRENE NITRILE + POLYVINYL ALCOHOL NITRILE POLYETHYLENE POLYVINYL CHLORIDE NEOPRENE + NATURAL RUBBER NEOPRENE/NATURAL RUBBER.

WEAR EYE PROTECTION TO PREVENT:
FOLLOWING INFORMATION FROM NIOSH/OSHA "OCCUPATIONAL HEALTH GUIDELINES FOR CHEMICAL HAZARDS":
EMPLOYERS SHALL PROVIDE AND ENSURE THAT EMPLOYEES USE SPLASH-PROOF SAFETY GOGGLES WHICH COMPLY WITH 29CFR1910.133(A)(2)-(A)(6) WHERE THIS LIQUID MAY CONTACT THE EYES.

EMPLOYEE SHOULD WASH:
FOLLOWING INFORMATION FROM NIOSH/OSHA "OCCUPATIONAL HEALTH GUIDELINES FOR CHEMICAL HAZARDS":
EMPLOYERS SHALL ENSURE THAT EMPLOYEES WHOSE SKIN BECOMES CONTAMINATED WITH THIS SUBSTANCE PROMPTLY WASH OR SHOWER WITH SOAP OR MILD DETERGENT AND WATER TO REMOVE ANY CONTAMINANT FROM THE SKIN.
EMPLOYERS SHALL ENSURE THAT EMPLOYEES WHO HANDLE THIS SUBSTANCE WASH THEIR HANDS THOROUGHLY WITH SOAP OR MILD DETERGENT AND WATER BEFORE EATING, SMOKING, OR USING TOILET FACILITIES.

WORK CLOTHING SHOULD BE CHANGED DAILY:
NO SPECIFIC REQUIREMENT. IF INDICATED BY THE NATURE OF THE CONTAMINANT AND THE EXTENT OF EXPOSURE, CHANGE INTO UNCONTAMINATED CLOTHING BEFORE LEAVING THE WORK PREMISES.

REMOVE CLOTHING:
FOLLOWING INFORMATION FROM NIOSH/OSHA "OCCUPATIONAL HEALTH GUIDELINES FOR CHEMICAL HAZARDS":
EMPLOYERS SHALL ENSURE THAT ANY CLOTHING WHICH BECOMES WET WITH THIS FLAMMABLE LIQUID BE REMOVED IMMEDIATELY AND NOT REWORN UNTIL THE SUBSTANCE IS REMOVED FROM THE CLOTHING.

THE FOLLOWING EQUIPMENT SHOULD BE AVAILABLE:
NO SPECIFIC REQUIREMENT. IF INDICATED BY THE NATURE OF THE SUBSTANCE AND THE PROBABILITY OF EXPOSURE, PROVIDE AN EYE WASH AND FACILITIES FOR QUICK DRENCHING OF THE BODY WITHIN THE IMMEDIATE WORK AREA FOR EMERGENCY USE.
RP

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RESPIRATOR SELECTION (UPPER LIMIT DEVICES PERMITTED):
1000 PPM
- CHEMICAL CARTRIDGE RESPIRATOR WITH AN ORGANIC VAPOR CARTRIDGE
- POWERED AIR-PURIFYING RESPIRATOR WITH AN ORGANIC VAPOR CARTRIDGE
- SUPPLIED-AIR RESPIRATOR
- SELF-CONTAINED BREATHING APPARATUS

ESCAPE
- GAS MASK WITH AN ORGANIC VAPOR CANISTER (CHIN-STYLE OR FRONTOR BACK-MOUNTED CANISTER)
- APPROPRIATE ESCAPE-TYPE SELF-CONTAINED BREATHING APPARATUS

FIREFIGHTING
- SELF-CONTAINED BREATHING APPARATUS WITH A FULL FACE-PIECE OPERATED IN PRESSURE-DEMAND OR POSITIVE-PRESSURE MODE
- SUPPLIED-AIR RESPIRATOR WITH A FULL FACEPIECE OPERATED IN PRESSURE-DEMAND OR OTHER POSITIVE PRESSURE MODE WITH AUXILIARY SELF-CONTAINED BREATHING APPARATUS OPERATED IN POSITIVE PRESSURE MODE.

MS
MEDICAL SURVEILLANCE:
GENERAL MEDICAL HISTORY.
EKG RECOMMENDED IF EMPLOYEE TO WEAR FULL-FACE RESPIRATOR.
40CFR717 RECORDS AND REPORTS OF ALLEGATIONS THAT CHEMICAL SUBSTANCES CAUSE SIGNIFICANT ADVERSE REACTIONS TO HEALTH OR THE ENVIRONMENT TOXIC SUBSTANCES CONTROL ACT (TSCA) SECTION 8(C) RULE REQUIRES MANUFACTURERS AND CERTAIN PROCESSORS OF CHEMICAL SUBSTANCES AND MIXTURES TO KEEP RECORDS OF SIGNIFICANT ADVERSE REACTIONS TO EMPLOYEE HEALTH FOR 30 YEARS.
PHYSICIAN PRE-PLACEMENT AND ANNUAL EXAMS.
MEDICAL WARNING FOR REFUSAL OF MEDICAL EXAMINATION.
OSHA: CENTRAL NERVOUS SYSTEM TESTS, PERIPHERAL NEUROPATHY.
VISION TEST.
EYE DISEASE.
GASTROINTESTINAL.
LIVER FUNCTION.
KIDNEY FUNCTION.
SKIN EXAM.
COMPLETE BLOOD COUNT.
URINALYSIS.
ACGIH BIOLOGICAL EXPOSURE INDICES FOR XYLENES: 1.5 G/G CREAT.
METHYLHIPPURIC ACIDS IN URINE /TIMING-END OF SHIFT 2 MG/MIN
METHYLHIPPURIC ACIDS IN URINE /TIMING--LAST 4 HRS OF SHIF.
29CFR1910.20 OSHA STANDARD SUBPART C - GENERAL SAFETY AND HEALTH PROVISIONS PROVIDES FOR EMPLOYEE, DESIGNATED REPRESENTATIVE, AND OSHA ACCESS TO EMPLOYER-MAINTAINED EXPOSURE AND MEDICAL RECORDS RELEVANT TO EMPLOYEES EXPOSED TO TOXIC SUBSTANCES AND HARMFUL PHYSICAL AGENTS.
53FR38140 9/29/88 (AMENDED).

RE
ROUTE OF ENTRY:
INHALATION. SKIN ABSORPTION. INGESTION. SKIN OR EYE CONTACT.

TO
TARGET ORGANS:
CENTRAL NERVOUS SYSTEM. EYES. GASTROINTESTINAL. BLOOD. LIVER. SKIN. KIDNEYS. RESPIRATORY SYSTEM.

SP
SYMPTOMS:
SKIN, COVERING OF BODY (SC0174);
IRRITATION, EXTREME REACTION TO A CONDITION (SC0090).

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EYE, ORGAN OF SIGHT (SC0170);
IRRITATION, EXTREME REACTION TO A CONDITION (SC0090).
MUCOUS MEMBRANE, MEMBRANE LINING PASSAGES/CAVITIES (SC0109);
IRRITATION, EXTREME REACTION TO A CONDITION (SC0090).
CENTRAL NERVOUS SYSTEM, PERTAINING TO NEURAL BODY SYSTEM (SC0028);
EXCITATION, CENTRAL NERVOUS SYSTEM STIMULATION (SC0289).
CENTRAL NERVOUS SYSTEM, PERTAINING TO NEURAL BODY SYSTEM (SC0028);
DEPRESSION, DECREASE IN ACTIVITY/FUNCTION (SC0043). EUPHORIA, AN EXAGGERATED FEELING OF WELL-BEING (SC0061). NYSTAGMUS, RHYTHMICAL OSCILLATION OF EYEBALLS (SC0443). HEADACHE, PAIN IN HEAD OR CRANIUM AREA (SC0075). NAUSEA, SICKNESS AT THE STOMACH (SC0115). VOMITING, PERTAINING TO NAUSEA (SC0166). ANOREXIA, DIMINISHED APPETITE (SC0006).
ABDOMINAL, SECTION BETWEEN THORAX AND PELVIS (SC0750);
PAIN, SUFFERING, EITHER PHYSICAL OR MENTAL (SC0182). DIZZINESS, FEELING FAINT, LIGHT-HEADED, UNSTEADY(SC0048). DROWSINESS, FALLING ASLEEP (SC0049). ATAXIA, MUSCULAR INCOORDINATION (SC0013). INCOORDINATION, LACK OF COORDINATION (SC0085). SALIVATION, EXCESS DISCHARGE OF SALIVA (SC0146). SPEECH DIFFICULTIES, TROUBLES WITH VERBAL EXPRESSION (SC0614).
BLURRED VISION, (SC0015). ERYTHEMA, REDNESS, SPOTS ON SKIN (SC0060).
TINNITUS, RINGING IN EARS (SC0308). TREMORS, TREMBLING, SHAKING (SC0197). CONFUSION, IN A BEWILDERED STATE (SC0030). FACE/NECK FLUSHED VASODILATION WITH HEAT OF FACE/NECK (SC0215). STUPOR, LETHARGY, UNCONSCIOUSNESS (SC0214). ANESTHESIA, LOSS OF SENSATION (SC0005).
AMNESIA, LOSS OF MEMORY (SC0438). HYPOTHERMIA, LOWERED BODY TEMPERATURE (SC0211).
LUNG, RESPIRATORY ORGAN (SC0377);
CONGESTION, ACCUMULATON OF BLOOD OR FLUID (SC0607). FATIGUE, TIREDNESS, SLUGGISH (SC0066). LASSITUDE, A SENSE OF WEARINESS (SC0098).
IRRITABILITY, QUICK EXCITABILITY TO ANNOYANCE (SC0091). DYSPNEA, DIFFICULTY IN BREATHING (SC0052). FLATULENCE, EXCESSIVE GAS IN STOMACH/INTESTINES (SC0751). PARESTHESIA, ABNORMAL SENSATION WITHOUT CAUSE (SC0125). APPREHENSION, FEELING OF UNEASINESS, FEAR, ANXIETY (SC0073). VESICULATION, BLISTERING (SC0164). PHOTOPHOBIA, INTOLERANCE TO LIGHT (SC0131).
TRANSIENT, PASSING QUICKLY (SC0731);
CORNEAL, TRANSPARENT MEMBRANE OVER EYE (SC0035).
DAMAGE, PERMANENT INJURY (SC0287).
MENSTRUAL DISORDERS, DISTURBANCE IN MENSES (SC0752). VENTRICULAR FIBRILLATION, RAPID CONTRACTIONS OF VENTRICLES (SC0162). INSOMNIA, INABILITY TO OBTAIN NORMAL SLEEP (SC0088). VERTIGO, FEELING OF WHIRLING MOTION (SC0163). THIRST, DESIRE FOR WATER (SC0210). ANEMIA, RED BLOOD CELLS LESS THAN NORMAL (SC0004). UNCONSCIOUSNESS, NOT AWAKE; INSENSIBLE (SC0198). COMA, STATE OF DEEP UNCONSCIOUSNESS (SC0583). LIVER DAMAGE, INJURY TO THE LIVER (SC0221). KIDNEY DAMAGE, INJURY TO THE KIDNEY (SC0220).
REPRODUCTIVE EFFECTS, BIRTH DEFECTS (SC0281);
IN EXPERIMENTAL ANIMALS, (SC0212).

FA

FIRST AID.

(1 OF 5)
IF THIS CHEMICAL GETS INTO THE EYES, WASH THE EYES IMMEDIATELY WITH LARGE AMOUNTS OF WATER OR NORMAL SALINE, OCCASIONALLY LIFTING UPPER AND LOWER LIDS, UNTIL NO EVIDENCE OF CHEMICAL REMAINS (APPROXIMATELY 15-20 MINUTES). GET MEDICAL ATTENTION IMMEDIATELY.

(2 OF 5)
IF THIS CHEMICAL GETS ON THE SKIN, REMOVE CONTAMINATED CLOTHING AND SHOES

IMMEDIATELY. WASH AFFECTED AREA WITH SOAP OR MILD DETERGENT AND LARGE AMOUNTS OF WATER UNTIL NO EVIDENCE OF CHEMICAL REMAINS (APPROXIMATELY 15-20 MINUTES). GET MEDICAL ATTENTION IMMEDIATELY.

(3 OF 5)
IF THIS CHEMICAL HAS BEEN INHALED, REMOVE FROM EXPOSURE AREA TO FRESH AIR IMMEDIATELY. IF BREATHING HAS STOPPED, PERFORM ARTIFICIAL RESPIRATION. KEEP PERSON WARM AND AT REST. TREAT SYMPTOMATICALLY AND SUPPORTIVELY. GET MEDICAL ATTENTION IMMEDIATELY.

(4 OF 5)
BENZENE/TOLUENE/XYLENE INGESTION: REMOVE BY GASTRIC LAVAGE BEING CAREFUL TO AVOID ASPIRATION. GENERAL MEASURES - CONTROL EXCITEMENT OR CONVULSIONS WITH DIAZEPAM, 0.1 MG/KG SLOW INTRAVENOUSLY. KEEP AT COMPLETE BED REST UNTIL RESPIRATION IS NORMAL. DO NOT GIVE EPINEPHRINE OR EPHEDRINE OR RELATED DRUGS. THEY MAY INDUCE FATAL VENTRICULAR FIBRILLATION. MONITOR ECG TO DETECT VENTRICULAR ABNORMALITIES FORESHADOWING POSSIBLE CARDIAC ARREST. SPECIAL PROBLEMS - TREAT ANEMIA BY REPEATED BLOOD TRANSFUSIONS. TREAT RESPIRATORY OR PULMONARY PROBLEMS. TREAT KIDNEY OR LIVER DAMAGE. GET MEDICAL ATTENTION IMMEDIATELY. TREATMENT MUST BE ADMINISTERED BY QUALIFIED MEDICAL PERSONNEL. (DREISBACH, HANDBOOK OF POISONING, 12TH ED.).

(5 OF 5)
GASTRIC LAVAGE - GIVE PATIENT GLASS OF WATER PRIOR TO PASSING OF STOMACH TUBE. LAY PATIENT ON ONE SIDE, WITH HEAD LOWER THAN WAIST. IMMOBILIZE A STRUGGLING PATIENT WITH A SHEET OR BLANKET. MEASURE DISTANCE ON TUBE FROM MOUTH TO EPIGASTRIUM, MARK TUBE WITH INDELIBLE MARKING OR TAPE. REMOVE DENTURES AND OTHER FOREIGN OBJECTS FROM THE MOUTH. OPEN MOUTH, USE GAG IF NECESSARY. EXTEND HEAD BY LIFTING CHIN. PASS TUBE OVER TONGUE AND TOWARD BACK OF THROAT WITHOUT EXTENDING HEAD OR NECK. IF OBSTRUCTION IS MET BEFORE THE MARK ON TUBE REACHES LEVELS OF THE TEETH, DO NOT FORCE, BUT REMOVE TUBE AND REPEAT PROCEDURE UNTIL TUBE PASSES TO MARK. PLACE END OF TUBE IN GLASS OF WATER. IF TUBE IS OBSTRUCTED WHEN INTRODUCED ABOUT HALFWAY TO THE MARK, IT MAY HAVE ENTERED TRACHEA. AFTER TUBE IS PLACED IN STOMACH, ASPIRATE FIRST TO REMOVE STOMACH CONTENTS BY IRRIGATION SYRINGE. SAVE STOMACH CONTENTS FOR EXAMINATION, AND REPEAT INTRODUCTION AND WITHDRAWL OF 100-300 ML WARM WATER UNTIL AT LEAST 3 LITERS OF CLEAR RETURN ARE OBTAINED. USE ACTIVATED CHARCOAL AT BEGINNING OF LAVAGE TO AID IN POISON INACTIVATION. LEAVE 50 GRAMS OF CHARCOAL SUSPENDED IN WATER IN THE STOMACH. IF INTRODUCTION AND REMOVAL OF LAVAGE FLUID BY GRAVITY REQUIRES MORE THAN FIVE MINUTES, ASSIST WITH ASEPTO SYRINGE. PREVENT ASPIRATION WITH CUFFED ENDOTRACHEAL TUBE. AVOID GIVING LARGE QUANTITIES OF WATER. IF PATIENT COMATOSE, INTUBATE TRACHEA WITH CUFFED ENDOTRACHEAL TUBE. SUCCINYLCHLORINE MAY BE ADMINISTERED BY QUALIFIED MEDICAL PERSONNEL TO EASE INSERTION OF TRACHEAL CATHETER PRIOR TO PASSAGE OF STOMACH TUBE. PROCEDURE MUST BE PERFORMED BY QUALIFIED MEDICAL PERSONNEL. (DREISBACH, HANDBOOK OF POISONING, 12TH ED.).

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SY SYNONYMS: AROCHLOR 1254. CHLORODIPHENYL 54% CL. UN 2315. NCI-C02664. PCB. POLYCHLORINATED BIPHENYL. POLYCHLORINATED BIPHENYL (AROCLOR 1254).
RN CAS NUMBER: 11097-69-1.

REG. TOXIC NUMBER: TQ1360000.

CHEMICAL FORMULA: NONE.

PD .
PHYSICAL DESCRIPTION:
LIGHT YELLOW, VISCOUS LIQUID
MILD HYDROCARBON ODOR.

MOL WT:	326
BOILING PT:	689 F
SOLUBILITY:	INSOLUBLE
FLASH PT:	432 F
VAPOR PRES:	0.00006 MM
MELT PT:	50 F
UEL IN AIR:	COMBUSTIBLE
LEL IN AIR:	COMBUSTIBLE
MEC IN AIR:	
SPEC GRAVITY:	1.495 TO 1.505
VAPOR DENSITY:	
ODOR THRESHOLD:	
OCTANOL/WATER CO-EFFICIENT:.	

EL
PERMISSABLE EXPOSURE:
0.5 MG/M3 OSHA TWA (SKIN)
0.5 MG/M3 ACGIH TWA
1.0 UG/M3 NIOSH RECOMMENDED 10 HOUR TWA
LOWEST FEASBILE LIMIT NIOSH RECOMMENDED EXPOSURE CRITERIA
HUMAN LIMITED EVIDENCE FOR CARCINOGENICITY (IARC GROUP-2A)
ANTICIPATED HUMAN CARCINOGEN (NTP)
PROBABLE HUMAN CARCINOGEN (EPA - CATEGORY B)
REPRODUCTIVE EFFECTS DATA (RTECS); MUTAGENIC DATA (RTECS)
AQUATIC TOXICITY RATING 2-4/+ (TLM96 <1 - 100 PPM)
ANIMAL SUFFICIENT EVIDENCE FOR CARCINOGENICITY (IARC GROUP-2A)
CERCLA HAZARD RATING - TOXICITY 3 - IGNITABILITY 1 - REACTIVITY 0 - PERSISTENCE 3
TOXICOLOGY: AROCLOR 1254 IS AN EYE, SKIN AND MUCOUS MEMBRANE IRRITANT. IT IS A HEPATOTOXIN. POISONING BY POLYCHLORINATED BIPHENYLS MAY AFFECT TISSUES AND ORGANS, ESPECIALLY THOSE RICH IN LIPIDS, DUE TO ACCUMULATION AS A RESULT OF POOR METABOLISM. EPIDEMIOLOGICAL DATA PROVIDE EVIDENCE OF A RELATIONSHIP BETWEEN EXPOSURE TO POLYCHLORINATED BIPHENYLS AND THE DEVELOPMENT OF MALIGNANT MELANOMAS. CERTAIN PCB'S ARE CARCINOGENIC TO MICE AND RATS AFTER ORAL ADMINISTRATION, PRODUCING BENIGN AND MALIGNANT LIVER NEOPLASMS. ORAL ADMINISTRATION OF PCB'S INCREASED THE INCIDENCE OF LIVER NEOPLASMS IN RATS PREVIOUSLY EXPOSED TO N-NITROSODIETHYLAMINE.
POLYCHLORINATED BIPHENYLS ARE TREATED AS MATERIALS WITH POOR WARNING PROPERTIES, AS NO QUANTITATIVE DATA ARE AVAILABLE CONCERNING ITS ODOR AND IRRITATION THRESHOLDS.
THE THRESHOLD LIMIT VALUE OF 0.5 MG/M3 IS RECOMMENDED AT THIS TIME, HOWEVER, THIS COMPOUND IS UNDER REVIEW.
ORL-RAT LD50: 1010 MG/KG INV-RAT LD50: 358 MG/KG
IPR-MUS LD50: 2840 MG/KG

OSHA STANDARD 1910.1200 HAZARD COMMUNICATION REQUIRES CHEMICAL

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MANUFACTURERS AND IMPORTERS TO ASSESS THE HAZARDS OF CHEMICALS WHICH THEY PRODUCE OR IMPORT, AND ALL EMPLOYERS TO PROVIDE INFORMATION TO THEIR EMPLOYEES CONCERNING HAZARDOUS CHEMICALS BY MEANS OF A HAZARD COMMUNICATION PROGRAM, LABELS AND OTHER FORMS OF WARNING, MATERIAL SAFETY DATA SHEETS, AND INFORMATION AND TRAINING. REQUIRES DISTRIBUTORS TO TRANSMIT REQUIRED INFORMATION TO EMPLOYEES.

DANGEROUS EXPOSURE:
5 MG/M3 POTENTIAL
CARCINOGENNIOSH
LIGHT YELLOW, VISCOUS LIQUID.

IC
INCOMPATIBILITIES:
THERMAL DECOMPOSITION PRODUCTS ARE HAZARDOUS AND/OR TOXIC. STRONG OXIDIZERS.

CL
CLOTHING:
FOLLOWING INFORMATION FROM NIOSH/OSHA "OCCUPATIONAL HEALTH GUIDELINES FOR CHEMICAL HAZARDS":
EMPLOYERS SHALL PROVIDE AND ENSURE THAT EMPLOYEES USE APPROPRIATE PROTECTIVE CLOTHING AND EQUIPMENT NECESSARY TO PREVENT ANY POSSIBILITY OF SKIN CONTACT WITH THIS SUBSTANCE. FACE SHIELDS SHALL COMPLY WITH 29CFR1910.133(A)(2), (A)(4), (A)(5), AND (A)(6).
EMPLOYERS SHALL ENSURE THAT CLOTHING CONTAMINATED WITH THIS SUBSTANCE IS PLACED IN CLOSED CONTAINERS FOR STORAGE UNTIL IT CAN BE DISCARDED OR UNTIL THE EMPLOYER PROVIDES FOR THE REMOVAL OF THE CONTAMINANT FROM THE CLOTHING. IF THE CLOTHING IS TO BE LAUNDERED OR OTHERWISE CLEANED TO REMOVE THE CONTAMINANT, THE EMPLOYER SHALL INFORM THE PERSON PERFORMING THE CLEANING OF THE HAZARDOUS PROPERTIES OF THE SUBSTANCE.
-ACGIH "GUIDELINES FOR THE SELECTION OF CHEMICAL PROTECTIVE CLOTHING" INDICATED THE FOLLOWING PROTECTIVE RATINGS FOR MATERIALS COMMONLY USED FOR PROTECTIVE CLOTHING. THESE RATINGS ARE BASED PRIMARILY ON QUANTITATIVE TEST RESULTS AND QUALITATIVE RESISTANCE INFORMATION. (THE RECOMMENDATIONS APPLY TO THE PURE SUBSTANCE ONLY; BREAKTHROUGH-TIME MAY VARY FOR MIXTURES.) (A "+" DESIGNATES A BLEND OF MATERIALS, WHILE A "/" DESIGNATES A COATED OR LAMINATED MATERIAL.) -
POLYCHLORINATED BIPHENYLS (UNDILUTED): EXCELLENT/GOOD: SARANEX GOOD/FAIR: POLYVINYL ALCOHOL VITON TEFLON POOR/FAIR: BUTYL RUBBER POLYETHYLENE NEOPRENE POLYVINYL CHLORIDE POOR: NATURAL RUBBER POLYETHYLENE.

WEAR EYE PROTECTION TO PREVENT:
FOLLOWING INFORMATION FROM NIOSH/OSHA "OCCUPATIONAL HEALTH GUIDELINES FOR CHEMICAL HAZARDS":
EMPLOYERS SHALL PROVIDE AND ENSURE THAT EMPLOYEES USE SPLASH-PROOF GOGGLES WHICH COMPLY WITH 29CFR1910.133(A)(2)-(A)(6) WHERE THERE IS ANY POSSIBILITY OF THIS LIQUID CONTACTING THE EYES.

EMPLOYEE SHOULD WASH:
FOLLOWING INFORMATION FROM NIOSH/OSHA "OCCUPATIONAL HEALTH GUIDELINES FOR CHEMICAL HAZARDS":
EMPLOYERS SHALL ENSURE THAT EMPLOYEES WHOSE SKIN BECOMES CONTAMINATED WITH THIS SUBSTANCE PROMPTLY WASH OR SHOWER WITH SOAP OR MILD DETERGENT AND WATER TO REMOVE ANY CONTAMINANT FROM THE SKIN.
EMPLOYERS SHALL ENSURE THAT EMPLOYEES WHO HANDLE THIS SUBSTANCE WASH THEIR HANDS THOROUGHLY WITH SOAP OR MILD DETERGENT AND WATER BEFORE EATING, SMOKING, OR USING TOILET FACILITIES.

WORK CLOTHING SHOULD BE CHANGED DAILY:

NOT REQUIRED.

REMOVE CLOTHING:
FOLLOWING INFORMATION FROM NIOSH/OSHA "OCCUPATIONAL HEALTH GUIDELINES FOR CHEMICAL HAZARDS":
EMPLOYERS SHALL ENSURE THAT NON-IMPERVIOUS CLOTHING WHICH BECOMES CONTAMINATED WITH THIS SUBSTANCE BE REMOVED IMMEDIATELY AND NOT REWORN UNTIL THE SUBSTANCE IS REMOVED FROM THE CLOTHING.

THE FOLLOWING EQUIPMENT SHOULD BE AVAILABLE:
FOLLOWING INFORMATION FROM NIOSH/OSHA "OCCUPATIONAL HEALTH GUIDELINES FOR CHEMICAL HAZARDS":
EMPLOYERS SHALL ENSURE THAT EMPLOYEES DO NOT EAT OR SMOKE IN AREAS WHERE THIS SUBSTANCE IS HANDLED, PROCESSED OR STORED.
EMPLOYERS SHALL ENSURE THAT AREAS IN WHICH EXPOSURE TO THIS SUBSTANCE MAY OCCUR BE IDENTIFIED BY SIGNS OR OTHER APPROPRIATE MEANS, AND THAT ACCESS TO THESE AREAS BE LIMITED TO AUTHORIZED PERSONS.

RP

RESPIRATOR SELECTION (UPPER LIMIT DEVICES PERMITTED):
ANY DETECTABLE CONC
- SELF-CONTAINED BREATHING APPARATUS WITH A FULL FACE-PIECE OPERATED IN PRESSURE-DEMAND OR POSITIVE-PRESSURE MODE
- SUPPLIED-AIR RESPIRATOR WITH A FULL FACEPIECE OPERATED IN PRESSURE-DEMAND OR OTHER POSITIVE PRESSURE MODE WITH AUXILIARY SELF-CONTAINED BREATHING APPARATUS OPERATED IN POSITIVE PRESSURE MODE

ESCAPE
- AIR-PURIFYING FULL FACEPIECE RESPIRATOR (GAS MASK) WITH A CHIN-STYLE OR FRONTOR BACK-MOUNTED ORGANIC VAPOR CANISTER HAVING A HIGH EFFICIENCY PARTICULATE FILTER
- APPROPRIATE ESCAPE-TYPE SELF-CONTAINED BREATHING APPARATUS

FIREFIGHTING
- SELF-CONTAINED BREATHING APPARATUS WITH A FULL FACE-PIECE OPERATED IN PRESSURE-DEMAND OR POSITIVE-PRESSURE MODE.

MS

MEDICAL SURVEILLANCE:
EKG RECOMMENDED IF EMPLOYEE TO WEAR FULL-FACE RESPIRATOR.
GENERAL MEDICAL HISTORY.
40CFR717 RECORDS AND REPORTS OF ALLEGATIONS THAT CHEMICAL SUBSTANCES CAUSE SIGNIFICANT ADVERSE REACTIONS TO HEALTH OR THE ENVIRONMENT TOXIC SUBSTANCES CONTROL ACT (TSCA) SECTION 8(C) RULE REQUIRES MANUFACTURERS AND CERTAIN PROCESSORS OF CHEMICAL SUBSTANCES AND MIXTURES TO KEEP RECORDS OF SIGNIFICANT ADVERSE REACTIONS TO EMPLOYEE HEALTH FOR 30 YEARS.
PHYSICIAN PRE-PLACEMENT AND ANNUAL EXAMS.
MEDICAL WARNING FOR REFUSAL OF MEDICAL EXAMINATION.
RESPIRATORY HISTORY.
BLOOD CHEMISTRY.
RENAL AND LIVER FUNCTIONS.
LDH.
SGOT.
SGPT.
SKIN EXAM.
VISION TEST.
PULMONARY FUNCTIONS.
ATTENTION TO SMOKING, ALCOHOL, MEDICATION, AND EXPOSURE TO CARCINOGENS.
29CFR1910.20 OSHA STANDARD SUBPART C - GENERAL SAFETY AND HEALTH

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PROVISIONS PROVIDES FOR EMPLOYEE, DESIGNATED REPRESENTATIVE, AND OSHA ACCESS TO EMPLOYER-MAINTAINED EXPOSURE AND MEDICAL RECORDS RELEVANT TO EMPLOYEES EXPOSED TO TOXIC SUBSTANCES AND HARMFUL PHYSICAL AGENTS. 53FR38140 9/29/88 (AMENDED).

RE

ROUTE OF ENTRY:
SKIN OR EYE CONTACT. INGESTION. INHALATION.

TO

TARGET ORGANS:
SKIN. EYES. LIVER. CENTRAL NERVOUS SYSTEM. KIDNEYS. HEART.

SP

SYMPTOMS:
SKIN, COVERING OF BODY (SC0174);
IRRITATION, EXTREME REACTION TO A CONDITION (SC0090).
EYE, ORGAN OF SIGHT (SC0170);
IRRITATION, EXTREME REACTION TO A CONDITION (SC0090).
MUCOUS MEMBRANE, MEMBRANE LINING PASSAGES/CAVITIES (SC0109);
IRRITATION, EXTREME REACTION TO A CONDITION (SC0090). HEADACHE, PAIN IN HEAD OR CRANIUM AREA (SC0075). NAUSEA, SICKNESS AT THE STOMACH (SC0115). VOMITING, PERTAINING TO NAUSEA (SC0166). ABDOMINAL CRAMPS, PAINFUL SPASMS OF ABDOMINAL AREA (SC0218). EDEMA, FLUID RETENTION WITH SWELLING (SC0181). ANOREXIA, DIMINISHED APPETITE (SC0006). FATIGUE, TIREDNESS, SLUGGISH (SC0066). JAUNDICE, YELLOWING OF SKIN, EYES (SC0092).
CHLORACNE, REDDISH DERMATOLOGICAL CONDITION (SC0276).
EXTRA, ADDITIONAL (SC0191);
PIGMENTATION, COLORATION (SC0132). EDEMA OF THE EYELIDS, SWELLING OF EYELIDS (SC0512). CONJUNCTIVITIS, INFLAMMATION OF EYES (SC0031).
BLURRED VISION, (SC0015). DIARRHEA, UNCONTROLLED LOOSE BOWELS (SC0046).
ANALGESIA, ABSENCE OF NORMAL SENSE OF PAIN (SC0453).
CENTRAL NERVOUS SYSTEM, PERTAINING TO NEURAL BODY SYSTEM (SC0028);
DEPRESSION, DECREASE IN ACTIVITY/FUNCTION (SC0043). PERIPHERAL NEUROPATHY, NERVE DISORDER OF EXTREMITIES (SC0128).
LIVER, BILE-SECRETING GLANDULAR ORGAN (SC0620);
TUMORS, BENIGN OR CANCEROUS ENLARGEMENTS (SC0578). COMA, STATE OF DEEP UNCONSCIOUSNESS (SC0583).
LUNG, RESPIRATORY ORGAN (SC0377);
INJURY, DAMAGE OR HURT SUFFERED (SC0087).
STOMACH, DIGESTIVE ORGAN (SC0358);
HEMORRHAGE, BLEEDING (SC0080).
PANCREAS, INSULIN PRODUCING GLAND (SC0262);
INJURY, DAMAGE OR HURT SUFFERED (SC0087).
KIDNEY, POST-PERITONEUM ORGAN FOR URINE WASTE(SC0094);
INJURY, DAMAGE OR HURT SUFFERED (SC0087). NEOPLASM, ABNORMAL TISSUE FORMATION (SC0272).

FA

FIRST AID.

(1 OF 5)
IF THIS CHEMICAL GETS INTO THE EYES, WASH THE EYES IMMEDIATELY WITH LARGE AMOUNTS OF WATER OR NORMAL SALINE, OCCASIONALLY LIFTING UPPER AND LOWER LIDS, UNTIL NO EVIDENCE OF CHEMICAL REMAINS (APPROXIMATELY 15-20 MINUTES). GET MEDICAL ATTENTION IMMEDIATELY.

(2 OF 5)
IF THIS CHEMICAL GETS ON THE SKIN, REMOVE CONTAMINATED CLOTHING AND SHOES IMMEDIATELY. WASH AFFECTED AREA WITH SOAP OR MILD DETERGENT AND LARGE AMOUNTS OF WATER UNTIL NO EVIDENCE OF CHEMICAL REMAINS (APPROXIMATELY 15-20 MINUTES). FOLLOW WITH APPLICATION OF CASTOR OIL OR 10% ETHYL

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Donohue & Assoc.
WTS Search #97300

HZDB DEC 1991 (9112)

1
AN ACCESSION NUMBER: 1655. 9112.
CN CHEMICAL NAME: LEAD.
SY SYNONYMS: C.I. PIGMENT METAL 4. C.I. 77575. LEAD FLAKE. KS-4. LEAD S2. SI. SO. S 1. PLUMBUM. PB-S 100. LEAD ELEMENT. L-18. L-24. L-29. L-27. T-134.
RN CAS NUMBER: 7439-92-1.

REG. TOXIC NUMBER: OF7525000.

CHEMICAL FORMULA: PB.

PD
PHYSICAL DESCRIPTION:
BLUISH-WHITE, SILVERY GRAY, HEAVY MALLEABLE METAL.

MOL WT:	207.19
BOILING PT:	3164 F (1740 C)
SOLUBILITY:	INSOLUBLE
FLASH PT:	NONCOMBUSTIBLE SOLID
VAPOR PRES:	1.3 MMHG @ 970 C
MELT PT:	622 F (328 C)
UEL IN AIR:	NOT AVAILABLE
LEL IN AIR:	NOT AVAILABLE
MEC IN AIR:	
SPEC GRAVITY:	11.3
VAPOR DENSITY:	
ODOR THRESHOLD:	
OCTANOL/WATER CO-EFFICIENT:.	

EL
PERMISSABLE EXPOSURE:
50 UG(PB)/M3 OSHA TWA; 30 UG(PB)/M3 OSHA TWA ACTION LEVEL
IF AN EMPLOYEE IS EXPOSED TO LEAD FOR MORE THAN 8 HOURS PER DAY THE FOLLOWING FORMULA IS USED:
MAXIMUM PERMISSIBLE LIMIT (IN UG/M3)= 400 DIVIDED BY HOURS WORKED
0.15 MG(PB)/M3 ACGIH TWA
<0.10 MG(PB)/M3 NIOSH RECOMMENDED 10 HOUR TWA
HUMAN INADEQUATE EVIDENCE FOR CARCINOGENICITY (IARC GROUP-2B)
ANIMAL SUFFICIENT EVIDENCE FOR CARCINOGENICITY (IARC GROUP-2B)
REPRODUCTIVE EFFECTS DATA (RTECS); MUTAGENIC DATA (RTECS)
CERCLA HAZARD RATINGS - TOXICITY 3 - IGNITABILITY 0 - REACTIVITY 0 - PERSISTENCE 3
TOXICOLOGY: LEAD MAY BE IRRITATING TO THE EYES AND SKIN. THERE IS INSUFFICIENT DATA TO QUANTIFY THE TOXICITY. IT IS A NEUROTOXIN, NEPHROTOXIN AND TERATOGEN. POISONING MAY ALSO AFFECT THE BLOOD, HEART, ENDOCRINE AND IMMUNE SYSTEMS. THE FATAL DOSE OF ABSORBED LEAD IS APPROXIMATELY 0.5 GRAMS. ACUTE EXPOSURES MAY RESULT IN METAL FUME FEVER WHILE CHRONIC EXPOSURE MAY RESULT IN "PLUMBISM" AND AN ACCUMULATION IN BODY TISSUES. REPRODUCTIVE EFFECTS HAVE BEEN EXHIBITED IN BOTH MALES AND FEMALES. PATERNAL EFFECTS MAY INCLUDE DECREASED SEX DRIVE, IMPOTENCE, STERILITY AND ADVERSE EFFECTS ON THE SPERM WHICH MAY INCREASE THE RISK OF BIRTH DEFECTS. MATERNAL EFFECTS MAY INCLUDE MISCARRIAGE AND STILLBIRTHS IN EXPOSED WOMEN OR WOMEN WHOSE HUSBANDS

WERE EXPOSED, ABORTION, STERILITY OR DECREASED FERTILITY, AND ABNORMAL MENSTRUAL CYCLES. RENAL TUMORS WERE PRODUCED IN ANIMALS BY LEAD ACETATE, SUBACETATE AND PHOSPHATE WHEN GIVEN ORALLY. NO EVALUATION COULD BE MADE OF THE CARCINOGENICITY OF POWDERED LEAD.
DUE TO THE LACK OF INFORMATION ON ODOR THRESHOLD AND EYE IRRITATION LEVELS, INORGANIC LEAD IS TREATED AS A MATERIAL WITH POOR WARNING PROPERTIES. THE THRESHOLD LIMIT VALUE WAS ESTABLISHED BASED ON SYSTEMIC EFFECTS.
PERSONS WITH NERVOUS SYSTEM OR GASTROINTESINAL DISRODERS, ANEMIA OR CHRONIC BRONCHITIS MAY BE AT AN INCREASED RISK FROM EXPOSURE. LEAD MAY CROSS THE PLACENTA AND AFFECT THE FETUS CAUSING BIRTH DEFECTS.
ORL-WMN TDLO: 450 MG/KG/6 Y IHL-HMN TDLO: 10 UG/M3

OSHA STANDARD 1910.1200 HAZARD COMMUNICATION REQUIRES CHEMICAL MANUFACTURERS AND IMPORTERS TO ASSESS THE HAZARDS OF CHEMICALS WHICH THEY PRODUCE OR IMPORT, AND ALL EMPLOYERS TO PROVIDE INFORMATION TO THEIR EMPLOYEES CONCERNING HAZARDOUS CHEMICALS BY MEANS OF A HAZARD COMMUNICATION PROGRAM, LABELS AND OTHER FORMS OF WARNING, MATERIAL SAFETY DATA SHEETS, AND INFORMATION AND TRAINING. REQUIRES DISTRIBUTORS TO TRANSMIT REQUIRED INFORMATION TO EMPLOYEES.

DANGEROUS EXPOSURE:
700 MG/M3 OSHA/NIOSH
BLUISH-WHITE, SILVERY GRAY, HE.

IC

INCOMPATIBILITIES:
LEAD: AMMONIUM NITRATE: VIOLENT OR EXPLOSIVE REACTION. CHLORINE TRIFLUORIDE: VIOLENT REACTION. DISODIUM ACETYLIDE: TRITURATION IN MORTAR MAY BE VIOLENT AND LIBERATE CARBON. HYDROGEN PEROXIDE (52% OR GREATER): VIOLENT DECOMPOSITION. HYDROGEN PEROXIDE (60% SOLUTION) AND TRIOXIANE: SPONTANEOUSLY DETONABLE. METALS (ACTIVE): INCOMPATIBLE. NITRIC ACID: LEAD-CONTAINING RUBBER MAY IGNITE. OXIDIZERS (STRONG): INCOMPATIBLE. SODIUM AZIDE: FORMS LEAD AZIDE AND COPPER AZIDE IN COPPER PIPE. SODIUM CARBIDE: VIGOROUS REACTION. SULFURIC ACID (HOT): REACTS. ZIRCONIUM-LEAD ALLOYS: IGNITION ON IMPACT.

CL

CLOTHING:
29CFR1910.1025 LEAD THE EMPLOYERS SHALL ASSURE THAT EMPLOYEES WHO ARE EXPOSED TO LEAD ABOVE THE PERMISSIBLE EXPOSURE LEVEL, WITHOUT REGARD TO THE USE OF RESPIRATORS OR WHERE THE POSSIBILITTY OF SKIN OR EYE IRRITATION EXISTS, BE PROVIDED WITH COVERALLS OR SIMILAR FULL-BODY WORK CLOTHING, GLOVES, HATS AND SHOES OR DISPOSABLE SHOE COVERLETS, FACESHIELDS, VENTED GOGGLES OR OTHER APPROPRIATE PROTECTIVE EQUIPMENT.

WEAR EYE PROTECTION TO PREVENT:
29CFR1910.1025 LEAD THE EMPLOYERS SHALL ASSURE THAT EMPLOYEES WEAR FACESHIELDS, VENTED GOGGLES OR OTHER APPROPRIATE PROTECTIVE EQUIPEMENT WHICH COMPLIES WITH 29CFR1910.133.

EMPLOYEE SHOULD WASH:
29CFR1910.1025 LEAD THE EMPLOYER SHALL ASSURE THAT EMPLOYEES WHO WORK IN AREAS WHERE THEIR AIRBORNE EXPOSURE TO LEAD IS ABOVE THE PERMISSIBLE EXPOSURE LEVEL, WITHOUT REGARD TO THE USE OF A RESPIRATOR, WASH THEIR HANDS AND FACE PRIOR TO EATING, DRINKIND OR APPLYING COSMETICS AND SHOWER AT THE END OF THE WORKSHIFT.

WORK CLOTHING SHOULD BE CHANGED DAILY:

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29CFR1910.1025 LEAD THE EMPLOYER SHALL ASSURE THAT ALL PROTECTIVE CLOTHING IS REMOVED AT THE COMPLETION OF A WORKSHIFT ONLY IN CHANGE ROOMS PROVIDED FOR THAT PURPOSE.

REMOVE CLOTHING:
NO SPECIFIC REGULATIONS UNDER 29CFR1910.
FOLLOWING INFORMATION FROM NIOSH/OSHA "OCCUPATIONAL HEALTH GUIDELINES FOR CHEMICAL HAZARDS":
EMPLOYERS SHALL ENSURE THAT NON-IMPERVIOUS CLOTHING WHICH BECOMES CONTAMINATED WITH THIS SUBSTANCE BE REMOVED PROMPTLY AND NOT REWORN UNTIL THE SUBSTANCE IS REMOVED FROM THE CLOTHING.

THE FOLLOWING EQUIPMENT SHOULD BE AVAILABLE:
NO SPECIFIC REQUIREMENT. IF INDICATED BY THE NATURE OF THE SUBSTANCE AND THE PROBABILITY OF EXPOSURE, PROVIDE AN EYE WASH AND FACILITIES FOR QUICK DRENCHING OF THE BODY WITHIN THE IMMEDIATE WORK AREA FOR EMERGENCY USE.
RP
RESPIRATOR SELECTION (UPPER LIMIT DEVICES PERMITTED):
LEAD
THE FOLLOWING RESPIRATORS ARE THE MINIMUM LEGAL REQUIREMENTS AS SET FORTH BY THE OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION FOUND IN 29CFR1910, SUBPART Z. NOT IN EXCESS OF 0.5 MG/M3 (10X PEL) - HALF-MASK, AIR-PURIFYING RESPIRATOR EQUIPPED WITH HIGH-EFFICIENCY FILTERS NOT IN EXCESS OF 2.5 MG/M3 (50X PEL) - FULL FACEPIECE, AIR-PURIFYING RESPIRATOR WITH HIGH-EFFICIENCY FILTERS NOT IN EXCESS OF 50 MG/M3 - ANY POWERED AIR-PURIFYING RESPIRATOR WITH HIGH-EFFICIENCY FILTERS - HALF-MASK SUPPLIED-AIR RESPIRATOR OPERATED IN POSITIVE PRESSURE MODE NOT IN EXCESS OF 100 MG/MG (2000X PEL) - SUPPLIED-AIR RESPIRATORS WITH FULL FACEPIECE, HOOD OR HELMET OR SUIT, OPERATED IN POSITIVE PRESSURE MODE GREATER THAN 100 MG/M3, UNKNOWN CONCENTRATIONS OR FIREFIGHTING - FULL FACEPIECE, SELF-CONTAINED BREATHING APPARATUS OPERATED IN POSITIVE PRESSUE MODE (RESPIRATORS SPECIFIED FOR HIGHER CONCENTRATIONS CAN BE USED A LOWER CONCENTRATIONS OF LEAD). (FULL FACEPIECE IS REQUIRED IF THE LEAD AEROSOLS CAUSE EYE AND SKIN IRRITATION AT THE USE CONCENTRATIONS.) (A HIGH EFFICIENCY PARTICULATE FILTER MEANS 99.97% EFFICIENT AGAINST 0.3 MICRON PARTICLES) THE FOLLOWING RESPIRATORS AND MAXIMUM USE CONCENTRATIONS ARE RECOMMENDATIONS BY THE U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES, NIOSH POCKET GUIDE TO CHEMICAL HAZARDS OR NIOSH CRITERIA DOCUMENTS.

0.5 MG(PB)/M3
- SUPPLIED-AIR RESPIRATOR
- AIR-PURIFYING RESPIRATOR WITH A HIGH-EFFICIENCY PARTICULATE FILTER
- SELF-CONTAINED BREATHING APPARATUS

1.25 MG(PB)/M3
- POWERED AIR-PURIFYING RESPIRATOR WITH A TIGHT-FITTING FACEPIECE AND HIGH-EFFICIENCY PARTICULATE FILTER
- SUPPLIED-AIR RESPIRATOR OPERATED IN CONTINUOUS FLOW MODE

2.5 MG(PB)/M3
- AIR-PURIFYING FULL FACEPIECE RESPIRATOR WITH A HIGH-EFFICIENCY PARTICULATE FILTER
- POWERED AIR-PURIFYING RESPIRATOR WITH A TIGHT-FITTING FACEPIECE AND HIGH-EFFICIENCY PARTICULATE FILTER
- SELF-CONTAINED BREATHING APPARATUS WITH A FULL FACE-PIECE
- SUPPLIED-AIR RESPIRATOR
WITH A FULL FACE-PIECE

- SUPPLIED-AIR RESPIRATOR WITH A TIGHT-FITTING FACEPIECE OPERATED IN A CONTINUOUS FLOW MODE

50 MG(PB)/M3
- SUPPLIED-AIR RESPIRATOR WITH HALF-MASK OPERATED IN PRESSURE-DEMAND OR OTHER POSITIVE PRESSURE MODE

100 MG(PB)/M3
- SUPPLIED-AIR RESPIRATOR WITH FULL FACEPIECE OPERATED IN PRESSURE-DEMAND OR OTHER POSITIVE PRESSURE MODE

ESCAPE
- AIR-PURIFYING FULL FACEPIECE RESPIRATOR WITH A HIGH-EFFICIENCY PARTICULATE FILTER
- APPROPRIATE ESCAPE-TYPE SELF-CONTAINED BREATHING APPARATUS

FIREFIGHTING
- SELF-CONTAINED BREATHING APPARATUS WITH A FULL FACE-PIECE OPERATED IN PRESSURE-DEMAND OR POSITIVE-PRESSURE MODE.

MS

MEDICAL SURVEILLANCE:
29CFR1910.1025 THE OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION REQUIRES EMPLOYERS TO PROVIDE A MEDICAL SURVEILLANCE PROGRAM FOR ALL EMPLOYEES WHO ARE OR MAY BE EXPOSED TO LEAD ABOVE THE ACTION LEVEL FOR MORE THAN 30 DAYS PER YEAR THIS MEDICAL SURVEILLANCE PROGRAM SHALL CONSIST OF: (1) INITIAL MEDICAL EXAMINATION INCLUDING: (A) WORK HISTORY (B) MEDICAL HISTORY WITH PARTICULAR ATTENTION TO: (1) PAST LEAD EXPOSURE (OCCUPATIONAL AND NON-OCCUPATIONAL) (2) PERSONAL HABITS (SMOKING, HYGIENE) (3) PAST GASTROINTESTINAL, HEMATOLOGIC, RENAL, REPRODUCITVE, CARDIOVASCULAR AND NEUROLOGIC PROBLEMS (C) PHYSICAL EXAMINATION (1) WITH PARTICULAR ATTENTION TO: (A) TEETH AND GUMS (B) HEMATOLOGIC SYSTEM (C) GASTROINTESTINAL SYSTEM (D) KIDNEYS (E) CARDIOVASCULAR SYSTEM (F) NEUROLOGICAL SYSTEM (G) PULMONARY STATUS IF RESPIRATORY PROTECTION WOULD BE USED (2) BLOOD PRESSURE MEASUREMENT (3) BLOOD SAMPLE AND ANALYSIS DETERMINING: (A) BLOOD LEAD LEVEL (B) HEMOGLOBIN AND HEMATOCRIT DETERMINATIONS, RED CELL INDICES, EXAM OF PERIPHERAL SMEAR MORPHOLOGY (C) ZINC PROTOPORPHYRIN (D) BLOOD UREA NITROGEN (E) SERUM CREATININE (4) URINALYSIS WITH MICROSCOPIC EXAM (5) ANY LABORATORY OR OTHER TEST DEEMED NECESSARY BY THE PHYSICIAN (2) PERIODIC EXAMINATIONS (A) BLOOD LEAD AND ZPP LEVEL TESTS AND ANALYSIS: (1) EVERY 6 MONTHS FOR EACH EMPLOYEE EXPOSED ABOVE THE ACTION LEVEL FOR MOR THAN 30 DAYS PER YEAR (2) AT LEAST EVERY 2 MONTHS FOR EACH EMPLOYEE WHOSE LAST BLOOD SAMPLING AND ANALYSIS INDICATED A BLOOD LEVEL AT OR ABOVE 40 UG/100 G OF WHOLE BLOOD. THIS FREQUENCY SHALL CONTINUE UNTIL 2 CONSECUTIVE BLOOD SAMPLES AND ANALYSES INDICATE A BLOOD LEAD LEVEL BELOW 40 UG/100 G OF WHOLE BLOOD (3) AT LEAST MONTHLY DURING THE REMOVAL PERIOD OF EACH EMPLOYEE REMOVED FROM EXPOSURE TO LEAD DUE TO AN ELEVATED BLOOD LEAD LEVEL (B) ALL TESTS CONDUCTED IN INITIAL EXAMINATION: (1) AT LEAST ANNUALLY FOR EACH EMPLOYEE FOR WHOM A BLOOD SAMPLING TEST CONDUCTED AT ANY TIME DURING THE PRECEDING 12 MONTHS INDICATED A BLOOD LEAD LEVEL AT OR ABOVE 400 UG/100 G (2) PRIOR TO ASSIGNMENT FOR EACH EMPLOYEE BEING ASSIGNED FOR THE FIRST TIME TO AN AREA IN WHICH AIRBORNE CONCENTRATIONS OF LEAD ARE AT OR ABOVE THE ACTION LEVEL (3) AS SOON AS POSSIBLE, UPON NOTIFICATION BY AN EMPLOYEE HAS DEVELOPED SIGNS OR SYMPTOMS ASSOCIATED WITH LEAD INTOXICATION, THAT THE EMPLOYEE DESIRES MEDICAL ADVICE CONCERNING THE EFFECTS OF CURRENT OR PAST EXPOSURE TO LEAD ON THE EMPLOYEES ABILITY TO PROVIDE A HEALTHY CHILD, OR THAT EMPLOYEE HAS DEMONSTRATED DIFFICULTY IN BREATHING DURING A RESPIRATORY FITTING TEST OR DURING USE (4) AS MEDICALLY APPROPRIATE FOR EACH EMPLOYEE

EITHER REMOVED FROM EXPOSURE TO LEAD DUE TO A RISK OF SUSTAINING MATERIAL IMPAIRMENT TO HEALTH, OR OTHERWISE LIMITED PURSUANT TO A FINAL MEDICAL DETERMINATION.
29CFR1910.20 OSHA STANDARD SUBPART C - GENERAL SAFETY AND HEALTH PROVISIONS PROVIDES FOR EMPLOYEE, DESIGNATED REPRESENTATIVE, AND OSHA ACCESS TO EMPLOYER-MAINTAINED EXPOSURE AND MEDICAL RECORDS RELEVANT TO EMPLOYEES EXPOSED TO TOXIC SUBSTANCES AND HARMFUL PHYSICAL AGENTS.
53FR38140 9/29/88 (AMENDED).
40CFR717 RECORDS AND REPORTS OF ALLEGATIONS THAT CHEMICAL SUBSTANCES CAUSE SIGNIFICANT ADVERSE REACTIONS TO HEALTH OR THE ENVIRONMENT TOXIC SUBSTANCES CONTROL ACT (TSCA) SECTION 8(C) RULE REQUIRES MANUFACTURERS AND CERTAIN PROCESSORS OF CHEMICAL SUBSTANCES AND MIXTURES TO KEEP RECORDS OF SIGNIFICANT ADVERSE REACTIONS TO EMPLOYEE HEALTH FOR 30 YEARS.
OTHER MEDICAL SURVEILLANCE RECOMMENDED: ACGIH BIOLOGICAL EXPOSURE INDICES FOR LEAD: 50 UG/100 ML LEAD IN BLOOD / TIMING -NOT CRITICAL 150 UG/G CREATINE LEAD IN URINE / TIMING -NOT CRITICAL 250 UG/100 ML ERYTHROCYTES OF 100 UG/100 ML BLOOD ZINC PROTOPORPHYRIN IN BLOOD / TIMING -AFTER ONE MONTH EXPOSURE.

RE

ROUTE OF ENTRY:
INHALATION. INGESTION. SKIN OR EYE CONTACT.

TO

TARGET ORGANS:
CENTRAL NERVOUS SYSTEM. CARDIOVASCULAR SYSTEM. GASTROINTESTINAL. KIDNEYS. REPRODUCTIVE SYSTEM. GINGIVAL TISSUE. BLOOD.

SP

SYMPTOMS:
SKIN, COVERING OF BODY (SC0174);
IRRITATION, EXTREME REACTION TO A CONDITION (SC0090).
EYE, ORGAN OF SIGHT (SC0170);
IRRITATION, EXTREME REACTION TO A CONDITION (SC0090). SALIVATION, EXCESS DISCHARGE OF SALIVA (SC0146). VOMITING, PERTAINING TO NAUSEA (SC0166). DIARRHEA, UNCONTROLLED LOOSE BOWELS (SC0046). CONSTIPATION, DIFFICULT, INFREQUENT DEFECATION (SC0032). FATIGUE, TIREDNESS, SLUGGISH (SC0066). SLEEP DISORDERS, CHANGE IN NORMAL SLEEP PATTERNS (SC0599). IRRITABILITY QUICK EXCITABILITY TO ANNOYANCE (SC0091). MEMORY DEFECTS, IMPERFECTION IN RECOLLECTION ABILITY (SC0585). INABILITY TO CONCENTRATE, INABILITY TO FOCUS ONE'S THOUGHTS (SC0586). DELIRIUM, STATE OF DISORIENTATION, CONFUSION (SC0288). PARESTHESIA, ABNORMAL SENSATION WITHOUT CAUSE (SC0125).
MUSCLE, TISSUE RESPONSIBLE FOR MOTION (SC0623);
PAIN, SUFFERING, EITHER PHYSICAL OR MENTAL (SC0182). WEAKNESS, LACK OF STRENGTH (SC0167).
LIVER, BILE-SECRETING GLANDULAR ORGAN (SC0620);
EFFECTS, SIGNS AND SYMPTOMS (SC0579). THIRST, DESIRE FOR WATER (SC0210). LETHARGY, SLUGGISHNESS (SC0595). HEADACHE, PAIN IN HEAD OR CRANIUM AREA (SC0075). SWEATING, EXCRETING MOISTURE THROUGH THE SKIN (SC0156).
EXCESSIVE, SUPERFLUOUS (SC0737);
URINATION, DISCHARGE OF URINE FROM BODY (SC0617). PROSTRATION, MARKED LOSS OF STRENGTH, EXHAUSTION (SC0139). FEVER, BODY TEMPERATURE ABOVE NORMAL (SC0067). CHILLS, A SHIVERING OR SHAKING (SC0736). PALLOR, PALENESS, AS OF THE SKIN (SC0122). FATIGUE, TIREDNESS, SLUGGISH (SC0066). WEIGHT LOSS, DROP IN BODY WEIGHT (SC0104). APATHY, LACK OF FEELING OR EMOTION (SC0008). GINGIVAL BLACK LINE, BLACK LINE ON GUMS (SC0207). ANEMIA, RED BLOOD CELLS LESS THAN NORMAL (SC0004). MYALGIA, MUSCLE PAIN OR TENDERNESS (SC0526).
ABDOMINAL, SECTION BETWEEN THORAX AND PELVIS (SC0750);

PAIN, SUFFERING, EITHER PHYSICAL OR MENTAL (SC0182). ATAXIA, MUSCULAR INCOORDINATION (SC0013). STUPOR, LETHARGY, UNCONSCIOUSNESS (SC0214). VISUAL DISTURBANCE, UPSET IN SIGHT (SC0165). ENCEPHALOPATHY, BRAIN DYSFUNCTION; BRAIN DISEASE (SC0336). DELIRIUM, STATE OF DISORIENTATION, CONFUSION (SC0288). MENTAL DISORDER, PSYCHIC DISTURBANCE (SC0608). SEIZURE, CONVULSION (SC0149). HYPERTENSION, HIGH BLOOD PRESSURE (SC0177).
CRANIAL NERVE, NERVE ARISING FROM THE BRAIN (SC0342);
PARALYSIS, LOSS OF POWER OF VOLUNTARY MOVEMENT (SC0124). KIDNEY DAMAGE INJURY TO THE KIDNEY (SC0220). CONVULSIONS, SUDDEN MUSCLE CONTRACTIONS (SC0034). REPRODUCTIVE EFFECTS, BIRTH DEFECTS (SC0281).
KIDNEY, POST-PERITONEUM ORGAN FOR URINE WASTE(SC0094);
TUMORS, BENIGN OR CANCEROUS ENLARGEMENTS (SC0578).

FA

FIRST AID.

(1 OF 5)
IF THIS CHEMICAL GETS INTO THE EYES, WASH THE EYES IMMEDIATELY WITH LARGE AMOUNTS OF WATER OR NORMAL SALINE, OCCASIONALLY LIFTING UPPER AND LOWER LIDS, UNTIL NO EVIDENCE OF CHEMICAL REMAINS (APPROXIMATELY 15-20 MINUTES). GET MEDICAL ATTENTION IMMEDIATELY.

(2 OF 5)
IF THIS CHEMICAL GETS ON THE SKIN, REMOVE CONTAMINATED CLOTHING AND SHOES IMMEDIATELY. WASH AFFECTED AREA WITH SOAP OR MILD DETERGENT AND LARGE AMOUNTS OF WATER UNTIL NO EVIDENCE OF CHEMICAL REMAINS (APPROXIMATELY 15-20 MINUTES). GET MEDICAL ATTENTION IMMEDIATELY.

(3 OF 5)
IF THIS CHEMICAL HAS BEEN INHALED, REMOVE FROM EXPOSURE AREA TO FRESH AIR IMMEDIATELY. IF BREATHING HAS STOPPED, PERFORM ARTIFICIAL RESPIRATION. KEEP PERSON WARM AND AT REST. TREAT SYMPTOMATICALLY AND SUPPORTIVELY. GET MEDICAL ATTENTION IMMEDIATELY.

(4 OF 5)
INGESTED LEAD COMPOUNDS: REMOVE INGESTED POISON BY GASTRIC LAVAGE WITH DILUTE MAGNESIUM SULFATE OR SODIUM SULFATE SOLUTION OR BY EMESIS. TREAT CEREBRAL EDEMA WITH MANNITOL AND PREDNISOLONE OR OTHER CORTICOSTEROID. GET MEDICAL ATTENTION IMMEDIATELY. ANTIDOTE: INITIATE URINE FLOW. GIVE 10% DEXTROSE IN WATER INTRAVENOUSLY, 10-20 ML/KG, FOR ONE TO TWO HOURS. IF URINE FLOW DOES NOT START, GIVE 20% SOLUTION OF MANNITOL, 5-10 ML/KG INTRAVENOUSLY, OVER TWENTY MINUTES. LIMIT FLUID TO REQUIREMENTS, AND CATHETERIZATION MAY BE NECESSARY IN COMA. DAILY URINE OUTPUT SHOULD BE 350-500 ML/M2/24 HOURS. EXCESSIVE FLUIDS FURTHER INCREASE CEREBRAL EDEMA. FOR ADULTS WITH ACUTE ENCEPHALOPATHY, GIVE DIMERCAPROL, 4 MG/KG, INTRAMUSCULARLY EVERY 4 HOURS FOR 30 DOSES. BEGINNING 4 HOURS LATER, GIVE CALCIUM DISODIUM EDETATE AT A SEPERATE INJECTION SITE, 12.5 MG/KG INTRAMUSCULARLY EVERY 4 HOURS AS A 20% SOLUTION, WITH 0.5% PROCAINE ADDED, FOR A TOTAL OF 30 DOSES. IF SIGNIFICANT IMPROVEMENT HAS NOT OCCURRED BY THE FOURTH DAY, INCREASE THE NUMBER OF INJECTIONS BY 10 FOR EACH DRUG. FOR SYMPTOMATIC ADULTS, THE COURSE OF DIMERCAPROL AND CALCIUM DISODIUM EDETATE CAN BE SHORTENED OR CALCIUM DISODIUM EDETATE ONLY CAN BE GIVIN IN A DOSAGE OF 50 MG/KG INTRAVENOUSLY AS 0.5% SOLUTION IN 5% DEXTROSE IN WATER OR NORMAL SAILINE BY INFUSION OVER NOT LESS THAN 8 HOURS FOR NOT MORE THAN 5 DAYS. FOLLOW WITH PENICILLAMINE, 500-750 MG/DAY, ORALLY FOR 1-2 MONTHS OR UNTIL URINE LEAD LEVELS DROPS BELOW 0.3 MG/24 HOURS. (DREISBACH, HANDBOOK OF POISONING, 12TH EDITION.) PROCEDURE MUST BE PERFORMED BY QUALIFIED MEDICAL PERSONNEL.

C:\PCPLUS\98221 02/10/92
MERCURY, INORGANIC. QUICKSILVER. NA 2809. COLLOIDOL MERCURY. NCI-C60399. QUICK SILVER. HYDRARGYRUM. RCRA U151. UN 2809. ELEMENTAL MERCURY.
RN CAS NUMBER: 7439-97-6.

REG. TOXIC NUMBER: OV4550000.

CHEMICAL FORMULA: HG.
PD
PHYSICAL DESCRIPTION:
ODORLESS, SILVERY LIQUID WITH A METALLIC LUSTER.

MOL WT:	200.59
BOILING PT:	674 F (357 C)
SOLUBILITY:	INSOLUBLE
FLASH PT:	NONCOMBUSTIBLE SOLID
VAPOR PRES:	0.002 MMHG @ 25 C
MELT PT:	-38 F (-39 C)
UEL IN AIR:	
LEL IN AIR:	NOT APPLICABLE
MEC IN AIR:	
SPEC GRAVITY:	13.5939
VAPOR DENSITY:	7.0
ODOR THRESHOLD:	
OCTANOL/WATER CO-EFFICIENT:.	

EL
PERMISSABLE EXPOSURE:
0.05 MG(HG)/M3 OSHA TWA (VAPOR); 0.1 MG(HG)/M3 OSHA CEILING (SKIN)
0.05 MG(HG)/M3 ACGIH TWA (VAPOR); 0.1 MG(HG)/M3 ACGIH TWA (SKIN)
0.05 MG(HG)/M3 NIOSH RECOMMENDED 10 HR TWA (SKIN)
TUMORIGENIC DATA (RTECS)
REPRODUCTIVE EFFECTS DATA (RTECS)
MUTAGENIC DATA (RTECS)
CERCLA HAZARD RATINGS - TOXICITY 3 - IGNITABILITY 0 - REACTIVITY 0 - PERSISTENCE 3
TOXICOLOGY: MERCURY IS A MUCOUS MEMBRANE IRRITANT AND A SKIN AND PULMONARY SENSITIZER. THERE IS INSUFFICIENT DATA TO FULLY QUANTIFY THE TOXICITY. IT IS A NEUROTOXIN AND NEPHROTOXIN. POISONING MAY ALSO AFFECT THE RESPIRATORY AND GASTROINTESTINAL SYSTEMS. METAL FUME FEVER, AN INFLUENZA-LIKE ILLNESS, MAY OCCUR DUE TO THE INHALATION OF FRESHLY FORMED METAL OXIDE PARTICLES SIZED USUALLY BETWEEN 0.02-0.05 MICRONS. SYMPTOMS MAY BE DELAYED 4-12 HOURS AND BEGIN WITH A SUDDEN ONSET. REPEATED EXPOSURE MAY CAUSE MERCURIALISM, WHICH IS CHARACTERIZED BY FINE TREMORS AND ERETHISM. TREMORS MAY AFFECT THE HANDS FIRST, BUT THEN BECOME EVIDENT IN THE FACE, ARMS AND LEGS. ERETHISM MAY BE MANIFESTED BY ABNORMAL SHYNESS, BLUSHING, RESENTMENT OF CRITICISM AND IRRITABILITY OR EXCITABILITY.
THE THRESHOLD LIMIT VALUE WAS ESTABLISHED BASED ON THE ABILITY OF MERCURY ABSORBED IN THE BRAIN TO REMAIN.
PERSONS WITH NERVOUS SYSTEM DISORDERS, CHRONIC RESPIRATORY DISEASE AND KIDNEYS DISEASE MAY BE AT AN INCREASED RISK FROM EXPOSURE.
IHL-WMN TCLO: 1500 UG/M3/46 D IHL-MAN TCLO: 44,300 UG/M3/8 HR
SKN-MAN TDLO: 129 MG/KG/5 HR C IHL-RBT LCLO: 29 MG/M3/30 HR

OSHA STANDARD 1910.1200 HAZARD COMMUNICATION REQUIRES CHEMICAL MANUFACTURERS AND IMPORTERS TO ASSESS THE HAZARDS OF CHEMICALS WHICH THEY PRODUCE OR IMPORT, AND ALL EMPLOYERS TO PROVIDE INFORMATION TO THEIR EMPLOYEES CONCERNING HAZARDOUS CHEMICALS BY MEANS OF A HAZARD

(5 OF 5)
GASTRIC LAVAGE - GIVE PATIENT GLASS OF WATER PRIOR TO PASSING OF STOMACH TUBE. LAY PATIENT ON ONE SIDE, WITH HEAD LOWER THAN WAIST. IMMOBILIZE A STRUGGLING PATIENT WITH A SHEET OR BLANKET. MEASURE DISTANCE ON TUBE FROM MOUTH TO EPIGASTRIUM, MARK TUBE WITH INDELIBLE MARKING OR TAPE. REMOVE DENTURES AND OTHER FOREIGN OBJECTS FROM THE MOUTH. OPEN MOUTH, USE GAG IF NECESSARY. EXTEND HEAD BY LIFTING CHIN. PASS TUBE OVER TONGUE AND TOWARD BACK OF THROAT WITHOUT EXTENDING HEAD OR NECK. IF OBSTRUCTION IS MET BEFORE THE MARK ON TUBE REACHES LEVELS OF THE TEETH, DO NOT FORCE, BUT REMOVE TUBE AND REPEAT PROCEDURE UNTIL TUBE PASSES TO MARK. PLACE END OF TUBE IN GLASS OF WATER. IF TUBE IS OBSTRUCTED WHEN INTRODUCED ABOUT HALFWAY TO THE MARK, IT MAY HAVE ENTERED TRACHEA. AFTER TUBE IS PLACED IN STOMACH, ASPIRATE FIRST TO REMOVE STOMACH CONTENTS BY IRRIGATION SYRINGE. SAVE STOMACH CONTENTS FOR EXAMINATION, AND REPEAT INTRODUCTION AND WITHDRAWL OF 100-300 ML WARM WATER UNTIL AT LEAST 3 LITERS OF CLEAR RETURN ARE OBTAINED. USE ACTIVATED CHARCOAL AT BEGINNING OF LAVAGE TO AID IN POISON INACTIVATION. LEAVE 50 GRAMS OF CHARCOAL SUSPENDED IN WATER IN THE STOMACH. IF INTRODUCTION AND REMOVAL OF LAVAGE FLUID BY GRAVITY REQUIRES MORE THAN FIVE MINUTES, ASSIST WITH ASEPTO SYRINGE. PREVENT ASPIRATION WITH CUFFED ENDOTRACHEAL TUBE. AVOID GIVING LARGE QUANTITIES OF WATER. IF PATIENT COMATOSE, INTUBATE TRACHEA WITH CUFFED ENDOTRACHEAL TUBE. SUCCINYLCHLORINE MAY BE ADMINISTERED BY QUALIFIED MEDICAL PERSONNEL TO EASE INSERTION OF TRACHEAL CATHETER PRIOR TO PASSAGE OF STOMACH TUBE. PROCEDURE MUST BE PERFORMED BY QUALIFIED MEDICAL PERSONNEL. (DREISBACH, HANDBOOK OF POISONING, 12TH ED.).

DT

SPECIAL DIAGNOSTIC TESTS AND INDEXES OF EXPOSURE:
COMPLETE BLOOD COUNT.
URINALYSIS.
BLOOD LEAD.
URINE LEAD AS EXPOSURE INDEX.
BLOOD ERYTHROCYTE PROTOPORPHYRIN BLOOD ERYTHOCYTE GAMMA-AMINOLEVULINIC ACID DEHYDRATASE URINE LEAD EXCRETION >0.08 MG/DAY URINE COPROPORPHYRIN >0.8 MG/L URINE GAMMA-AMINOLEVULINIC ACID >6 MG/L.

RS

REGULATORY STATUS.

(1 OF 44)
****
FEDERAL REGULATIONS
**********.

(2 OF 44)
OSHA STANDARD 1910.1200 HAZARD COMMUNICATION REQUIRES CHEMICAL MANUFACTURERS AND IMPORTERS TO ASSESS THE HAZARDS OF CHEMICALS WHICH THEY PRODUCE OR IMPORT, AND ALL EMPLOYERS TO PROVIDE INFORMATION TO THEIR EMPLOYEES CONCERNING HAZARDOUS CHEMICALS BY MEANS OF A HAZARD COMMUNICATION PROGRAM, LABELS AND OTHER FORMS OF WARNING, MATERIAL SAFETY DATA SHEETS, AND INFORMATION AND TRAINING. REQUIRES DISTRIBUTORS TO TRANSMIT REQUIRED INFORMATION TO EMPLOYEES.

(3 OF 44)
OSHA STANDARD 29CFR1910.1025 LEAD.

(4 OF 44)
OSHA STANDARD 29CFR1910.252 WELDING, CUTTING, AND BRAZING.

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COMMUNICATION PROGRAM, LABELS AND OTHER FORMS OF WARNING, MATERIAL SAFETY DATA SHEETS, AND INFORMATION AND TRAINING. REQUIRES DISTRIBUTORS TO TRANSMIT REQUIRED INFORMATION TO EMPLOYEES.

DANGEROUS EXPOSURE:
28 MG/M3 OSHA/NIOSH
ODORLESS, SILVERY LIQUID WITH.

IC

INCOMPATIBILITIES:
SEND BACK AREA EXCEDED. ACETYLENE: FORMATION OF EXPLOSIVE COMPOUND. ACETYLINIC COMPOUNDS: FORMATION OF EXPLOSIVE COMPOUND. ALUMINUM: CORRODES. AMINES: MAY FORM EXPLOSIVE COMPOUNDS. AMMONIA + MOISTURE: FORMS EXPLOSIVE COMPOUND. BORON DIIODOPHOSPHIDE: IGNITES ON CONTACT WITH MERCURY VAPORS. BROMINE: VIOLENT REACTION. 3-BROMOPROPYNE: EXPLOSION HAZARD. CALCIUM: AMALGAM FORMATION @ 390 C IS VIOLENT. CHLORINE: IGNITES @ 200-300 C. CHLORINE DIOXIDE: EXPLODES. COPPER (AND ALLOYS): MAY BE ATTACKED. ETHYLENE OXIDE + TRACES OF ACETYLENE: MAY FORM EXPLOSIVE ACETYLIDES. LITHIUM: AMALGAM FORMATION IS VIOLENTLY EXOTHERMIC AND MAY BE EXPLOSIVE. METHYL AZIDE: PRODUCES SHOCK SENSITIVE MIXTURE. METHYLSILANE + OXYGEN: PRODUCES SHOCK SENSITIVE MIXTURE. NITRIC ACID + ALCOHOLS: FORMS FULMINATES CAPABLE OF DETONATION. OXALIC ACID: FORMS SHOCK SENSITIVE COMPOUND. OXIDANTS: VIOLENT REACTION. PEROXYFORMIC ACID: EXPLOSIVE REACTION. POTASSIUM: AMALGAM FORMATION IS VIGOROUSLY EXOTHERMIC AND MAY BE EXPLOSIVE.

CL

CLOTHING:
FOLLOWING INFORMATION FROM NIOSH/OSHA "OCCUPATIONAL HEALTH GUIDELINES FOR CHEMICAL HAZARDS":
EMPLOYERS SHALL PROVIDE AND ENSURE THAT EMPLOYEES USE APPROPRIATE PROTECTIVE CLOTHING AND EQUIPMENT NECESSARY TO PREVENT REPEATED OR PROLONGED SKIN CONTACT WITH THIS SUBSTANCE. FACE SHIELDS SHALL COMPLY WITH 29CFR1910.133(A)(2), (A)(4), (A)(5), AND (A)(6).
EMPLOYERS SHALL ENSURE THAT CLOTHING CONTAMINATED WITH THIS SUBSTANCE IS PLACED IN CLOSED CONTAINERS FOR STORAGE UNTIL IT CAN BE DISCARDED OR UNTIL THE EMPLOYER PROVIDES FOR THE REMOVAL OF THE CONTAMINANT FROM THE CLOTHING. IF THE CLOTHING IS TO BE LAUNDERED OR OTHERWISE CLEANED TO REMOVE THE CONTAMINANT, THE EMPLOYER SHALL INFORM THE PERSON PERFORMING THE CLEANING OF THE HAZARDOUS PROPERTIES OF THE SUBSTANCE.

WEAR EYE PROTECTION TO PREVENT:
NO SPECIFIC REQUIREMENT. USE APPROPRIATE SAFETY GOGGLES, AS INDICATED BY THE NATURE OF THE CONTAMINANT AND THE LIKELIHOOD OF EXPOSURE.

EMPLOYEE SHOULD WASH:
FOLLOWING INFORMATION FROM NIOSH/OSHA "OCCUPATIONAL HEALTH GUIDELINES FOR CHEMICAL HAZARDS":
EMPLOYERS SHALL ENSURE THAT ALL EMPLOYEES SUBJECT TO SKIN CONTACT WITH THIS SUBSTANCE WASH WITH SOAP OR MILD DETERGENT AND WATER ANY AREAS OF THE BODY WHICH MAY HAVE CONTACTED THE SUBSTANCE AT THE END OF EACH WORK DAY.
EMPLOYERS SHALL ENSURE THAT EMPLOYEES WHOSE SKIN BECOMES CONTAMINATED WITH THIS SUBSTANCE PROMPTLY WASH OR SHOWER WITH SOAP OR MILD DETERGENT AND WATER TO REMOVE ANY CONTAMINANT FROM THE SKIN.
EMPLOYERS SHALL ENSURE THAT EMPLOYEES WHO HANDLE THIS SUBSTANCE WASH THEIR HANDS THOROUGHLY WITH SOAP OR MILD DETERGENT AND WATER BEFORE EATING, SMOKING, OR USING TOILET FACILITIES.

WORK CLOTHING SHOULD BE CHANGED DAILY:

FOLLOWING INFORMATION FROM NIOSH/OSHA "OCCUPATIONAL HEALTH GUIDELINES FOR CHEMICAL HAZARDS":
EMPLOYERS SHALL ENSURE THAT EMPLOYEES WHOSE CLOTHING MAY HAVE BECOME CONTAMINATED WITH THIS SUBSTANCE CHANGE INTO UNCONTAMINATED CLOTHING BEFORE LEAVING THE WORK PREMISES.

REMOVE CLOTHING:
FOLLOWING INFORMATION FROM NIOSH/OSHA "OCCUPATIONAL HEALTH GUIDELINES FOR CHEMICAL HAZARDS":
EMPLOYERS SHALL ENSURE THAT NON-IMPERVIOUS CLOTHING WHICH BECOMES CONTAMINATED WITH THIS SUBSTANCE BE REMOVED PROMPTLY AND NOT REWORN UNTIL THE SUBSTANCE IS REMOVED FROM THE CLOTHING.

THE FOLLOWING EQUIPMENT SHOULD BE AVAILABLE:
FOLLOWING INFORMATION FROM NIOSH/OSHA "OCCUPATIONAL HEALTH GUIDELINES FOR CHEMICAL HAZARDS":
EMPLOYERS SHALL ENSURE THAT EMPLOYEES DO NOT EAT OR SMOKE IN AREAS WHERE THIS SUBSTANCE IS HANDLED, PROCESSED OR STORED.

RP

RESPIRATOR SELECTION (UPPER LIMIT DEVICES PERMITTED):

0.5 MG/M3

- CHEMICAL CARTRIDGE RESPIRATOR PROVIDING PROTECTION AGAINST SPECIFIC COMPOUND OF CONCERN
- SUPPLIED-AIR RESPIRATOR
- SELF-CONTAINED BREATHING APPARATUS

1.25 MG/M3

- SUPPLIED-AIR RESPIRATOR OPERATED IN CONTINUOUS FLOW MODE
- POWERED AIR-PURIFYING RESPIRATOR WITH CARTRIDGE PROVIDING PROTECTION AGAINST THE COMPOUND OF CONCERN

2.5 MG/M3

- SUPPLIED-AIR RESPIRATOR WITH A FULL FACE-PIECE
- SELF-CONTAINED BREATHING APPARATUS WITH A FULL FACE-PIECE
- SUPPLIED-AIR RESPIRATOR WITH A TIGHT-FITTING FACEPIECE OPERATED IN A CONTINUOUS FLOW MODE
- CHEMICAL CARTRIDGE RESPIRATOR PROVIDING PROTECTION AGAINST SPECIFIC COMPOUND OF CONCERN WITH A FULL FACE-PIECE
- GAS MASK WITH A CANISTER PROVIDING PROTECTION AGAINST SPECIFIC COMPOUND OF CONCERN (CHIN-STYLE OR FRONTOR BACK-MOUNTED CANISTER)
- POWERED AIR-PURIFYING RESPIRATOR WITH A TIGHT-FITTING FACEPIECE AND CARTRIDGE PROVIDING PROTECTION AGAINST COMPOUND OF CONCERN

28 MG/M3

- SUPPLIED-AIR RESPIRATOR WITH HALF-MASK OPERATED IN PRESSURE-DEMAND OR OTHER POSITIVE PRESSURE MODE

ESCAPE

- GAS MASK WITH A CANISTER PROVIDING PROTECTION AGAINST SPECIFIC COMPOUND OF CONCERN (CHIN-STYLE OR FRONTOR BACK-MOUNTED CANISTER)
- APPROPRIATE ESCAPE-TYPE SELF-CONTAINED BREATHING APPARATUS

FIREFIGHTING

- SELF-CONTAINED BREATHING APPARATUS WITH A FULL FACE-PIECE OPERATED IN PRESSURE-DEMAND OR POSITIVE-PRESSURE MODE
- SUPPLIED-AIR RESPIRATOR WITH A FULL FACEPIECE OPERATED IN PRESSURE-DEMAND OR OTHER POSITIVE PRESSURE MODE WITH AUXILIARY

C:\PCPLUS\98221 02/10/92
SELF-CONTAINED BREATHING APPARATUS OPERATED IN POSITIVE PRESSURE MODE.
MS
MEDICAL SURVEILLANCE:
29CFR1910.20 OSHA STANDARD SUBPART C - GENERAL SAFETY AND HEALTH PROVISIONS PROVIDES FOR EMPLOYEE, DESIGNATED REPRESENTATIVE, AND OSHA ACCESS TO EMPLOYER-MAINTAINED EXPOSURE AND MEDICAL RECORDS RELEVANT TO EMPLOYEES EXPOSED TO TOXIC SUBSTANCES AND HARMFUL PHYSICAL AGENTS.
53FR38140 9/29/88 (AMENDED).
40CFR717 RECORDS AND REPORTS OF ALLEGATIONS THAT CHEMICAL SUBSTANCES CAUSE SIGNIFICANT ADVERSE REACTIONS TO HEALTH OR THE ENVIRONMENT TOXIC SUBSTANCES CONTROL ACT (TSCA) SECTION 8(C) RULE REQUIRES MANUFACTURERS AND CERTAIN PROCESSORS OF CHEMICAL SUBSTANCES AND MIXTURES TO KEEP RECORDS OF SIGNIFICANT ADVERSE REACTIONS TO EMPLOYEE HEALTH FOR 30 YEARS.
FOLLOWING INFORMATION FROM NIOSH/OSHA "OCCUPATIONAL HEALTH GUIDELINES FOR CHEMICAL HAZARDS".
GENERAL MEDICAL HISTORY.
PHYSICIAN PRE-PLACEMENT AND ANNUAL EXAMS.
HISTORY OF ASTHMA OR ALLERGIES.
RESPIRATORY HISTORY.
PULMONARY FUNCTIONS.
CENTRAL NERVOUS SYSTEM TESTS, PERIPHERAL NEUROPATHY.
KIDNEY FUNCTION.
URINALYSIS.
NOTICE OF INTENT TO ESTABLISH: ACGIH BIOLOGICAL EXPOSURE INDICIES FOR MERCURY: 35 UG/G CREATININE TOTAL INORGANIC MERCURY IN URINE / TIMING -PRE-SHIFT 15 UG/L TOTAL INORGANIC MERCURY IN BLOOD / TIMING -END OF SHIFT AT END OF WORKWEEK.
RE
ROUTE OF ENTRY:
INHALATION. SKIN ABSORPTION. INGESTION. SKIN OR EYE CONTACT.
TO
TARGET ORGANS:
SKIN. RESPIRATORY SYSTEM. CENTRAL NERVOUS SYSTEM. KIDNEYS. EYES.
SP
SYMPTOMS:
SKIN, COVERING OF BODY (SC0174);
IRRITATION, EXTREME REACTION TO A CONDITION (SC0090).
EYE, ORGAN OF SIGHT (SC0170);
IRRITATION, EXTREME REACTION TO A CONDITION (SC0090). DYSPNEA, DIFFICULTY IN BREATHING (SC0052). COUGHING, FORCEFUL EXPIRATION (SC0173). FEVER, BODY TEMPERATURE ABOVE NORMAL (SC0067). NAUSEA, SICKNESS AT THE STOMACH (SC0115). VOMITING, PERTAINING TO NAUSEA (SC0166). DIARRHEA, UNCONTROLLED LOOSE BOWELS (SC0046). HEADACHE, PAIN IN HEAD OR CRANIUM AREA (SC0075). STOMATITIS, INFLAMMATION OF THE MOUTH (SC0395). SALIVATION, EXCESS DISCHARGE OF SALIVA (SC0146). METALLIC TASTE, TASTE RESEMBLING METAL IN MOUTH (SC0216).
SKIN, COVERING OF BODY (SC0174);
SENSITIZATION, ALLERGIC REACTION (SC0148). DERMATITIS, INFLAMMATION OF SKIN (SC0044).
PULMONARY, PERTAINING TO THE RESPIRATORY TRACT (SC0500);
SENSITIZATION, ALLERGIC REACTION (SC0148). BRONCHITIS, INFLAMED BRONCHIAL MUCOUS MEMBRANES (SC0017). PNEUMONITIS, LOCALIZED INFLAMMATION OF LUNG (SC0137). ENCEPHALITIS, INFLAMMATION OF THE BRAIN (SC0307). TREMORS, TREMBLING, SHAKING (SC0197). ERETHISM, EXCESSIVE SENSIBILITY TO STIMULATION (SC0729). MENTAL DEPRESSION, ABSENCE OF CHEERFULNESS (SC0280). IRRITABILITY, QUICK EXCITABILITY TO ANNOYANCE (SC0091). EXCITABILITY, SENSITIVITY TO EMOTIONAL STIMULATION (SC0592). FATIGUE,

TIREDNESS, SLUGGISH (SC0066). INSOMNIA, INABILITY TO OBTAIN NORMAL SLEEP (SC0088). HALLUCINATIONS, PERCEPTIONS OF WHAT DOES NOT EXIST (SC0074). MEMORY DEFECTS, IMPERFECTION IN RECOLLECTION ABILITY (SC0585). MENTAL DISORDER, PSYCHIC DISTURBANCE (SC0608). PROTEINURIA, PROTEIN IN URINE, OFTEN ALBUMIN (SC0140). ALBUMINURIA, ALBUMIN (PROTEIN) IN URINE (SC0002). ANURIA, COMPLETE LACK OF URINATION (SC0304). GINGIVITIS, GUM INFLAMMATION (SC0515). GINGIVAL BLUE LINE, BLUE LINE ON GUMS (SC0575). EXTREMITIES, ARMS OR LEGS (SC0062);
PAIN, SUFFERING, EITHER PHYSICAL OR MENTAL (SC0182).
EXTREMITIES, ARMS OR LEGS (SC0062);
NUMBNESS, COMBINED ANESTHESIA AND PARESTHESIA (SC0120). WEIGHT LOSS, DROP IN BODY WEIGHT (SC0104). ANOREXIA, DIMINISHED APPETITE (SC0006). SPEECH DIFFICULTIES, TROUBLES WITH VERBAL EXPRESSION (SC0614). ACIDOSIS ACID IMBALANCE (SC0290).
PULMONARY, PERTAINING TO THE RESPIRATORY TRACT (SC0500);
EDEMA, FLUID RETENTION WITH SWELLING (SC0181). DIARRHEA, UNCONTROLLED LOOSE BOWELS (SC0046). INCOORDINATION, LACK OF COORDINATION (SC0085). ANEMIA, RED BLOOD CELLS LESS THAN NORMAL (SC0004). KIDNEY DAMAGE, INJURY TO THE KIDNEY (SC0220).
NERVE, BUNDLE OF NERVE FIBERS (SC0726);
DAMAGE, PERMANENT INJURY (SC0287).
REPRODUCTIVE EFFECTS, BIRTH DEFECTS (SC0281);
IN EXPERIMENTAL ANIMALS, (SC0212). HEMATURIA, RED BLOOD CELLS IN URINE (SC0076). ALBUMINURIA, ALBUMIN (PROTEIN) IN URINE (SC0002). FEVER, BODY TEMPERATURE ABOVE NORMAL (SC0067).
BLINDNESS, INABILITY TO SEE (SC0223);.

FA

FIRST AID.

(1 OF 5)
IF THIS CHEMICAL GETS INTO THE EYES, WASH THE EYES IMMEDIATELY WITH LARGE AMOUNTS OF WATER OR NORMAL SALINE, OCCASIONALLY LIFTING UPPER AND LOWER LIDS, UNTIL NO EVIDENCE OF CHEMICAL REMAINS (APPROXIMATELY 15-20 MINUTES). GET MEDICAL ATTENTION IMMEDIATELY.

(2 OF 5)
IF THIS CHEMICAL GETS ON THE SKIN, REMOVE CONTAMINATED CLOTHING AND SHOES IMMEDIATELY. WASH AFFECTED AREA WITH SOAP OR MILD DETERGENT AND LARGE AMOUNTS OF WATER UNTIL NO EVIDENCE OF CHEMICAL REMAINS (APPROXIMATELY 15-20 MINUTES). GET MEDICAL ATTENTION IMMEDIATELY.

(3 OF 5)
IF THIS CHEMICAL HAS BEEN INHALED, REMOVE FROM EXPOSURE AREA TO FRESH AIR IMMEDIATELY. IF BREATHING HAS STOPPED, PERFORM ARTIFICIAL RESPIRATION. KEEP PERSON WARM AND AT REST. TREAT SYMPTOMATICALLY AND SUPPORTIVELY. GET MEDICAL ATTENTION IMMEDIATELY.

(4 OF 5)
INGESTED MERCURY: REMOVE BY GASTRIC LAVAGE OR EMESIS. MAINTAIN BLOOD PRESSURE AND AIRWAY. GIVE OXYGEN IF RESPIRATION IS DEPRESSED. DO NOT PERFORM GASTRIC LAVAGE OR EMESIS IF VICTIM IS UNCONSCIOUSS. GET MEDICAL ATTENTION IMMEDIATELY. ADMINISTRATION OF GASTRIC LAVAGE OR OXYGEN SHOULD BE PERFORMED BY QUALIFIED MEDICAL PERSONNEL. ANTIDOTE: GIVE DIMERCAPROL, 3 MG/KG (OR 0.3 ML/KG) EVERY 4 HOURS FOR THE FIRST 2 DAYS AND THEN 2 MG/KG EVERY 12 HOURS FOR A TOTAL OF 10 DAYS. DIMERCAPTROL IS AVAILABLE AS A 10% SOLUTION IN OIL FOR INTRAMUSCULAR ADMINISTRATION. HEMODIALYSIS WILL SPEED THE REMOVAL OF THE MERCURY-DIMERCAPROL COMPLEX. PENICILLAMINE IS ALSO EFFECTIVE. GIVE UP TO 100 MG/KG/DAY (MAXIMUM 1 GM/DAY) DIVIDED

Genium Publishing Corporation
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Sheet No. 470
Diesel Fuel Oil No. 2-D

Issued: 10/81 Revision: A, 11/90

Section 1. Material Identification

Diesel Fuel Oil No. 2-D Description: Diesel fuel is obtained from the middle distillate in petroleum separation; a distillate oil of low sulfur content. It is composed chiefly of unbranched paraffins. Diesel fuel is available in various grades, one of which is synonymous with fuel oil No. 2-D. This diesel fuel oil requires a minimum Cetane No. (efficiency rating for diesel fuel comparable to octane number ratings for gasoline) of 40 (ASTM D613). Used as a fuel for trucks, ships, and other automotive engines; as mosquito control (coating on breeding waters); and for drilling muds.

R 1
I -
S 2
K 2

NFPA
2
0 0
-

HMIS
H 0
F 2
R 0
PPG*
* Sec. 8

Other Designations: CAS No. 68334-30-5, diesel fuel.

Manufacturer: Contact your supplier or distributor. Consult the latest *Chemicalweek Buyers' Guide*(TM) for a suppliers list.

Cautions: Diesel fuel oil No. 2-D is a skin irritant and central nervous depressant with high mist concentrations. It is an environmental hazard and moderate fire risk.

Section 2. Ingredients and Occupational Exposure Limits

Diesel fuel oil No. 2-D*

1989 OSHA PEL	1990-91 ACGIH TLV	1988 NIOSH REL	1985-86 Toxicity Data‡
None established	Mineral Oil Mist TWA: 5 mg/m³† STEL: 10 mg/m³	None established	Rat, oral, LD_{50}: 9 g/kg produces gastrointestinal (hypermotility, diarrhea) effects

* Diesel fuel No. 2-D tends to be low in aromatics and high in paraffinics. This fuel oil is complex mixture of: 1) >95% paraffinic, olefinic, naphthenic, and aromatic hydrocarbons, 2) sulfur (<0.5%), and 3) benzene (<100 ppm). [A low benzene level reduces carcinogenic risk. Fuel oils can be exempted under the benzene standard (29 CFR 1910.1028)]. Although low in the fuel itself, benzene concentrations are likely to be much higher in processing areas.

† As sampled by nonvapor-collecting method.

‡ Monitor NIOSH, *RTECS* (HZ1800000), for future toxicity data.

Section 3. Physical Data

Boiling Point Range: 340 to 675 °F (171 to 358 °C)
Viscosity: 1.9 to 4.1 centistoke at 104 °F (40 °C)
Specific Gravity: <0.86
Water Solubility: Insoluble

Appearance and Odor: Brown, slightly viscous liquid.

Section 4. Fire and Explosion Data

Flash Point: 125 °F (52 °C) min.	Autoignition Temperature: >500 °F (932 °C)	LEL: 0.6% v/v	UEL: 7.5% v/v

Extinguishing Media: Use dry chemical, carbon dioxide, or foam to fight fire. Use a water spray to cool fire exposed containers. Do not use a forced water spray directly on burning oil since this will scatter the fire. Use a smothering technique for extinguishing fire.

Unusual Fire or Explosion Hazards: Diesel fuel oil No. 2-D is a OSHA Class II combustible liquid. Its volatility is similar to that of gas oil. Vapors may travel to a source of ignition and flash back.

Special Fire-fighting Procedures: Isolate hazard area and deny entry. Since fire may produce toxic fumes, wear a self-contained breathing apparatus (SCBA) with a full facepiece operated in the pressure-demand or positive-pressure mode and full protective clothing. If feasible, remove containers from fire. Be aware of runoff from fire control methods. Do not release to sewers or waterways due to pollution and fire or explosion hazard.

Section 5. Reactivity Data

Stability/Polymerization: Diesel fuel oil No. 2-D is stable at room temperature in closed containers under normal storage and handling conditions. Hazardous polymerization cannot occur.

Chemical Incompatibilities: It is incompatible with strong oxidizing agents; heating greatly increases the fire hazard.

Conditions to Avoid: Avoid heat and ignition sources.

Hazardous Products of Decomposition: Thermal oxidative decomposition of diesel fuel oil No. 2-D can produce various hydrocarbons and hydrocarbon derivatives, and other partial oxidation products such as carbon dioxide, carbon monoxide, and sulfur dioxide.

Section 6. Health Hazard Data

Carcinogenicity: Although the IARC has not assigned an overall evaluation to diesel fuels as a group, it has evaluated occupational exposures in petroleum refining as an IARC probable human carcinogen (Group 2A). It has evaluated distillate (light) diesel oils as not classifiable as human carcinogens (Group 3).
Summary of Risks: Although diesel fuel's toxicologic effects should resemble kerosine's, they are somewhat more pronounced due to additives such as sulfurized esters. Excessive inhalation of aerosol or mist can cause respiratory tract irritation, headache, dizziness, nausea, vomiting, and loss of coordination, depending on concentration and exposure time. When removed from exposure area, affected persons usually recover completely. If vomiting occurs after ingestion and if oil is aspirated into the lungs, hemorrhaging and pulmonary edema, progressing to renal involvement and chemical pneumonitis, may result. A comparative ratio of oral to aspirated lethal doses may be 1 pt vs. 5 ml. Aspiration may also result in transient CNS depression or excitement. Secondary effects may include hypoxia (insufficient oxygen in body cells), infection, pneumatocele formation, and chronic lung dysfunction. Inhalation may result in euphoria, cardiac dysrhythmias, respiratory arrest, and CNS toxicity. Prolonged or repeated skin contact may irritate hair follicles and block sebaceous glands, producing a rash of acne pimples and spots, usually on arms and legs.
Medical Conditions Aggravated by Long-Term Exposure: None reported.
Target Organs: Central nervous system, skin, and mucous membranes.
Primary Entry Routes: Inhalation, ingestion.
Acute Effects: Systemic effects from ingestion include gastrointestinal irritation, vomiting, diarrhea, and in severe cases central nervous system depression, progressing to coma or death. Inhalation of aerosols or mists may result in increased rate of respiration, tachycardia (excessively rapid heart beat), and cyanosis (dark purplish discoloration of the skin and mucous membranes caused by deficient blood oxygenation).
Chronic Effects: Repeated contact with the skin causes dermatitis.
FIRST AID
Eyes: Gently lift the eyelids and flush immediately and continuously with flooding amounts of water until transported to an emergency medical facility. Consult a physician immediately.
Skin: *Quickly* remove contaminated clothing. Rinse with flooding amounts of water for at least 15 min. If large areas of the body have been exposed or if irritation persists, get medical help immediately. Wash affected area with soap and water.
Inhalation: Remove exposed person to fresh air and support breathing as needed.
Ingestion: Never give anything by mouth to an unconscious or convulsing person. If ingested, *do not induce vomiting* due to aspiration hazard. Contact a physician immediately. Position to avoid aspiration.
After first aid, get appropriate in-plant, paramedic, or community medical support.
Note to Physicians: Gastric lavage is contraindicated due to aspiration hazard. Preferred antidotes are charcoal and milk. In cases of severe aspiration pneumonitis, consider monitoring arterial blood gases to ensure adequate ventilation. Observe the patient for 6 hr. If vital signs become abnormal or symptoms develop, obtain a chest x-ray.

Section 7. Spill, Leak, and Disposal Procedures

Spill/Leak: Notify safety personnel, evacuate area for large spills, remove all heat and ignition sources, and provide maximum explosion-proof ventilation. Cleanup personnel should protect against vapor inhalation and liquid contact. Clean up spills promptly to reduce fire or vapor hazards. Use a noncombustible absorbent material to pick up small spills or residues. For large spills, dike far ahead to contain. Pick up liquid for reclamation or disposal. Do not release to sewers or waterways due to health and fire and/or explosion hazard. Follow applicable OSHA regulations (29 CFR 1910.120). Diesel fuel oil No. 2-D spills may be environmental hazards. Report large spills.
Disposal: Contact your supplier or a licensed contractor for detailed recommendations. Follow applicable Federal, state, and local regulations.
EPA Designations
RCRA Hazardous Waste (40 CFR 261.21): Ignitable waste
CERCLA Hazardous Substance (40 CFR 302.4): Not listed
SARA Extremely Hazardous Substance (40 CFR 355): Not listed
SARA Toxic Chemical (40 CFR 372.65): Not listed
OSHA Designations
Air Contaminant (29 CFR 1910.1000, Subpart Z): Not listed

Section 8. Special Protection Data

Goggles: Wear protective eyeglasses or chemical safety goggles, per OSHA eye- and face-protection regulations (29 CFR 1910.133).
Respirator: Seek professional advice prior to respirator selection and use. Follow OSHA respirator regulations (29 CFR 1910.134) and, if necessary, use a NIOSH-approved respirator with a mist filter and organic vapor cartridge. For emergency or nonroutine operations (cleaning spills, reactor vessels, or storage tanks), wear an SCBA. *Warning! Air-purifying respirators do not protect workers in oxygen-deficient atmospheres.*
Other: Wear impervious gloves, boots, aprons, and gauntlets to prevent skin contact.
Ventilation: Provide general and local explosion-proof ventilation systems to maintain airborne concentrations that promote worker safety and productivity. Local exhaust ventilation is preferred since it prevents contaminant dispersion into the work area by controlling it at its source.[NIOSH]
Safety Stations: Make available in the work area emergency eyewash stations, safety/quick-drench showers, and washing facilities.
Contaminated Equipment: Never wear contact lenses in the work area: soft lenses may absorb, and all lenses concentrate, irritants. Remove this material from your shoes and equipment. Launder contaminated clothing before wearing.
Comments: Never eat, drink, or smoke in work areas. Practice good personal hygiene after using this material, especially before eating, drinking, smoking, using the toilet, or applying cosmetics.

Section 9. Special Precautions and Comments

Storage Requirements: Use and storage conditions should be suitable for a OSHA Class II combustible liquid. Store in closed containers in a well-ventilated area away from heat and ignition sources and strong oxidizing agents. Protect containers from physical damage. To prevent static sparks, electrically ground and bond all containers and equipment used in shipping, receiving, or transferring operations. Use nonsparking tools and explosion-proof electrical equipment. No smoking in storage or use areas.
Engineering Controls: Avoid vapor or mist inhalation and prolonged skin contact. Wear protective rubber gloves and chemical safety glasses where contact with liquid or high mist concentration may occur. Additional suitable protective clothing may be required depending on working conditions. Institute a respiratory protection program that includes regular training, maintenance, inspection, and evaluation. Practice good personal hygiene and housekeeping procedures. Do not wear oil contaminated clothing. At least weekly laundering of work clothes is recommended. Do not put oily rags in pockets. When working with this material, wear gloves or use barrier cream.
Transportation Data (49 CFR 172.101)
DOT Shipping Name: Fuel oil
DOT Hazard Class: Combustible liquid
ID No.: NA1993
DOT Label: None
DOT Packaging Exceptions: 173.118a
DOT Packaging Requirements: None

MSDS Collection References: 1, 6, 7, 12, 73, 84, 101, 103, 126, 127, 132, 133, 136, 143, 146
Prepared by: MJ Allison, BS; Industrial Hygiene Review: DJ Wilson, CIH; Medical Review: AC Darlington, MD; Edited by: JR Stuart, MS

DOD Hazardous Materials Information System
DoD 6050.5-LR
AS OF April 1996
Proprietary Version - For U.S. Government Use Only

FSC: 9130
NIIN: 002644538
Manufacturer's CAGE: 3R475
Part No. Indicator: A
Part Number/Trade Name: PREMIUM LEADED GASOLINE

General Information

Item Name: GASOLINE AUTOMOTIVE
Company's Name: FLYING J INC
Company's Street: 48 W 990 S
Company's P. O. Box: 678
Company's City: BRIGHAM CITY
Company's State: UT
Company's Country: US
Company's Zip Code: 84302-3121
Company's Emerg Ph #: 800-424-9300
Company's Info Ph #: 801-298-7733
Distributor/Vendor # 1:
Distributor/Vendor # 1 Cage:
Distributor/Vendor # 2:
Distributor/Vendor # 2 Cage:
Distributor/Vendor # 3:
Distributor/Vendor # 3 Cage:
Distributor/Vendor # 4:
Distributor/Vendor # 4 Cage:
Safety Data Action Code:
Safety Focal Point: D
Record No. For Safety Entry: 013
Tot Safety Entries This Stk#: 021
Status: SM
Date MSDS Prepared: 13FEB92
Safety Data Review Date: 13NOV92
Supply Item Manager: CD
MSDS Preparer's Name:
Preparer's Company:
Preparer's St Or P. O. Box:
Preparer's City:
Preparer's State:
Preparer's Zip Code:
Other MSDS Number:
MSDS Serial Number: BPHJQ
Specification Number: VV-G-1690
Spec Type, Grade, Class:
Hazard Characteristic Code: F2
Unit Of Issue: GL
Unit Of Issue Container Qty: BULK
Type Of Container: BULK
Net Unit Weight: UNKNOWN

Report for NIIN: 002644538

NRC/State License Number: N/R
Net Explosive Weight: N/R
Net Propellant Weight-Ammo: N/R
Coast Guard Ammunition Code: N/R

Ingredients/Identity Information

Proprietary: NO
Ingredient: GASOLINE
Ingredient Sequence Number: 01
Percent: UNKNOWN
Ingredient Action Code:
Ingredient Focal Point: D
NIOSH (RTECS) Number: LX3300000
CAS Number: 8006-61-9
OSHA PEL: 300 PPM/500 STEL
ACGIH TLV: 300 PPM/500STEL;9293
Other Recommended Limit: NONE RECOMMENDED

Proprietary: NO
Ingredient: BENZENE (SARA III)
Ingredient Sequence Number: 02
Percent: UNKNOWN
Ingredient Action Code:
Ingredient Focal Point: D
NIOSH (RTECS) Number: CY1400000
CAS Number: 71-43-2
OSHA PEL: 1PPM/5STEL;1910.1028
ACGIH TLV: 10 PPM; A2; 9293
Other Recommended Limit: NONE RECOMMENDED

Proprietary: NO
Ingredient: TETRAETHYL LEAD (SARA III)
Ingredient Sequence Number: 03
Percent: UNKNOWN
Ingredient Action Code:
Ingredient Focal Point: D
NIOSH (RTECS) Number: TP4550000
CAS Number: 78-00-2
OSHA PEL: S, 0.075MG/M3(PB)
ACGIH TLV: S, 0.1 MG/M3(PB)9293
Other Recommended Limit: NONE RECOMMENDED

Physical/Chemical Characteristics

Appearance And Odor: CLEAR TO BRONZE OR RED COLOR WITH STRONG HYDROCARBON ODOR.
Boiling Point: >80F,>27C
Melting Point: UNKNOWN
Vapor Pressure (MM Hg/70 F): >9 PSIG
Vapor Density (Air=1): UNKNOWN
Specific Gravity: >0.73
Decomposition Temperature: UNKNOWN

Report for NIIN: 002644538

Evaporation Rate And Ref: UNKNOWN
Solubility In Water: NEGLIGIBLE
Percent Volatiles By Volume: 100
Viscosity:
pH: N/R
Radioactivity: N/R
Form (Radioactive Matl):
Magnetism (Milligauss): N/P
Corrosion Rate (IPY): UNKNOWN
Autoignition Temperature: 495F

Fire and Explosion Hazard Data

Flash Point: -40F,-40C
Flash Point Method: N/P
Lower Explosive Limit: 1%
Upper Explosive Limit: 8%
Extinguishing Media: DRY CHEMICAL, FOAM, CARBON DIOXIDE. WATER MAY BE INEFFECTIVE ON BURNING PRODUCT.
Special Fire Fighting Proc: WEAR SELF-CONTAINED BREATHING APPARATUS AND BUNKER GEAR. USE WATER TO COOL FIRE EXPOSED CAONTAINERS AND PERSONNEL. USE WATER TO DISPERSE VAPORS.
Unusual Fire And Expl Hazrds: CLOTHING, RAGS, OR SIMILAR ORGANIC MATERIALS CONTAMINATED WITH PRODUCT AND STORED IN A CLOSED SPACE MAY UNDERGO SPONTANEOUS COMBUSTION.

Reactivity Data

Stability: YES
Cond To Avoid (Stability): SOURCES OF IGNITION AND CONTACT WITH INCOMPATIBLES
Materials To Avoid: STRONG OXIDIZING AGENTS, ORGANIC MATERIALS
Hazardous Decomp Products: OXIDES OF CARBON AND OTHER TOXIC MATERIALS.
Hazardous Poly Occur: NO
Conditions To Avoid (Poly): NONE

Health Hazard Data

LD50-LC50 Mixture: ORAL LD50 (RAT) IS 18.8 ML/KG
Route Of Entry - Inhalation: YES
Route Of Entry - Skin: NO
Route Of Entry - Ingestion: YES
Health Haz Acute And Chronic: ACUTE: CONTACT WITH LIQUID MAY CAUSE EYE IRRITATION. INHALATION OF VAPORS MAY CAUSE RESPIRATORY IRRITATION AND CENTRAL NERVOUS SYSTEM EFFECTS. INGESTION OF LIQUID MAY CAUSE IRRITATION OF MOUTH, THROAT, AND STOMACH. CHRONIC: PROLONGED OR REPEATED CONTACT MAY IRRITATE SKIN.
Carcinogenicity - NTP: YES
Carcinogenicity - IARC: YES
Carcinogenicity - OSHA: YES
Explanation Carcinogenicity: BENZENE IS LISTED BY IARC/NTP AS KNOWN CARCINOGEN AND IS REGULATED BY OSHA AS A CARCINOGEN.
Signs/Symptoms Of Overexp: INHALED: COUGHING, SHORTNESS OF BREATH, NAUSEA,

VOMITING, HEADACHE, DIZZINESS, DROWSINESS. EYES: TEARING, BLURRED VISION, DISCOMFORT, BURNING SENSATION. SKIN: RASH, ITCHING. INGESTED: NAUSEA, VOMITING.
Med Cond Aggravated By Exp: NONE SPECIFIED BY MANUFACTURER.
Emergency/First Aid Proc: INHALED: REMOVE PERSON TO FRESH AIR. GIVE RESPIRAORY SUPPORT IF NEEDED. SEE DOCTOR IF SYMPTOMS PERSIST. EYES: FLUSH WITH WATER FOR 15 MINUTES WHILE HOLDING EYELIDS OPEN. SEE DOCTOR. SKIN: REMOVE CONTAMINATED CLOTHES. WASH WITH SOAP AND WATER. INGESTED: DO NOT INDUCE VOMITING. GET IMMEDIATE MEDICAL ATTENTION.

Precautions for Safe Handling and Use

Steps If Matl Released/Spill: ELIMINATE ALL SOURCES OF IGNITION. CONTAIN SPILL. KEEP OUT OF SEWERS AND WATERWAYS. ABSORB WITH INERT MATERIAL AND PLACE IN A CONTAINER FOR LATER DISPOSAL.
Neutralizing Agent: NONE SPECIFIED BY MANUFACTURER.
Waste Disposal Method: DISPOSE OF IN ACCORDANCE WITH LOCAL, STATE AND FEDERAL REGULATIONS.
Precautions-Handling/Storing: STORE IN FLAMMABLE LIQUIDS STORAGE AREA. STORE AWAY FROM HEAT AND SOURCES OF IGNITION AND INCOMPATIBLES.
Other Precautions: AVOID CONTACT WITH SKIN, EYES, OR CLOTHES. AVOID BREATHING VAPORS. USE PROPER BONDING AND GROUNDING PROCEDURES DURING TRANSFER OPERATIONS.

Control Measures

Respiratory Protection: NONE NORMALLY REQUIRED.
Ventilation: USE ADEQUATE MECHANICAL (EXPOLOSION-PROOF) VENTILATION.
Protective Gloves: NEOPRENE
Eye Protection: SAFETY GLASSES/CHEMICAL SPLASH GOGGLES
Other Protective Equipment: CLOTHING AND BOOTS TO PREVENT PROLONGED OR REPEATED CONTACT
Work Hygienic Practices: WASH HANDS AFTER USE AND BEOFRE EATING, DRINKING, OR SMOKING. LAUNDER CONTAMINATED CLOTHES BEFORE REUSE.
Suppl. Safety & Health Data:

Genium Publishing Corporation
1145 Catalyn Street
Schenectady, NY 12303-1836 USA
(518) 377-8854

Material Safety Data Sheets Collection:

Sheet No. 467
Automotive Gasoline, Lead-free

Issued: 10/81 Revision: A, 9/91

Section 1. Material Identification

35

Automotive Gasoline, Lead-free, Description: A mixture of volatile hydrocarbons composed mainly of branched-chain paraffins, cycloparaffins, olefins, naphthenes, and aromatics. In general, gasoline is produced from petroleum, shale oil, Athabasca tar sands, and coal. Motor gasolines are made chiefly by cracking processes, which convert heavier petroleum fractions into more volatile fractions by thermal or catalytic decomposition. Widely used as fuel in internal combustion engines of the spark-ignited, reciprocating type. Automotive gasoline has an octane number of approximately 90. A high content of aromatic hydrocarbons and a consequent high toxicity are also associated with a high octane rating. Some gasolines sold in the US contain a minor proportion of tetraethyllead, which is added in concentrations not exceeding 3 ml per gallon to prevent engine "knock." However, methyl-tert-butyl ether (MTBE) has almost completely replaced tetraethyllead.

Other Designations: CAS No. 8006-61-9, benzin, gasoline, gasolene, motor spirits, natural gasoline, petrol.

Manufacturer: Contact your supplier or distributor. Consult latest *Chemical Week Buyers' Guide*(TM) for a suppliers list.

R 1
I 2
S 2*
K 4
* Skin absorption

NFPA

HMIS
H 2
F 3
R 1
PPG†
† Sec. 8

Cautions: Inhalation of automotive gasoline vapors can cause intense burning in throat and lungs, central nervous system (CNS) depression, and possible fatal pulmonary edema. Gasoline is a dangerous fire and explosion hazard when exposed to heat and flames.

Section 2. Ingredients and Occupational Exposure Limits

Automotive gasoline, lead-free*

1990 OSHA PELs
8-hr TWA: 300 ppm, 900 mg/m³
15-min STEL: 500 ppm, 1500 mg/m³

1990-91 ACGIH TLVs
TWA: 300 ppm, 890 mg/m³
STEL: 500 ppm, 1480 mg/m³

1990 NIOSH REL
None established

1985-86 Toxicity Data*
Man, inhalation, TC_{Lo}: 900 ppm/1 hr; toxic effects include sense organs and special senses (conjunctiva irritation), behavioral (hallucinations, distorted perceptions), lungs, thorax, or respiration (cough)
Human, eye: 140 ppm/8 hr; toxic effects include mild irritation
Rat, inhalation, LC_{50}: 300 g/m³/5 min

* A typical modern gasoline composition is 80% paraffins, 14% aromatics, and 6% olefins. The mean benzene content is approximately 1%. Other additives include sulfur, phosphorus, and MTBE.
† See NIOSH, *RTECS* (LX3300000), for additional toxicity data.

Section 3. Physical Data

Boiling Point: Initially, 102 °F (39 °C); after 10% distilled, 140 °F (60 °C); after 50% distilled, 230 °F (110 °C); after 90% distilled, 338 °F (170 °C); final boiling point, 399 °F (204 °C)
Vapor Density (air = 1): 3.0 to 4.0
Density/Specific Gravity: 0.72 to 0.76 at 60 °F (15.6 °C)
Water Solubility: Insoluble

Appearance and Odor: A clear (gasoline may be colored with dye), mobile liquid with a characteristic odor recognizable at about 10 ppm in air.

Section 4. Fire and Explosion Data

Flash Point: -45 °F (-43 °C)	Autoignition Temperature: 536 to 853 °F (280 to 456 °C)	LEL: 1.3% v/v	UEL: 6.0% v/v

Extinguishing Media: Use dry chemical, carbon dioxide, or alcohol foam as extinguishing media. Use of water may be ineffective to extinguish fire, but use water spray to knock down vapors and to cool fire-exposed drums and tanks to prevent pressure rupture. Do not use a solid stream of water since it may spread the fuel.

Unusual Fire or Explosion Hazards: Automobile gasoline is an OSHA Class IB flammable liquid and a dangerous fire and explosion hazard when exposed to heat and flames. Vapors can flow to an ignition source and flash back. Automobile gasoline can also react violently with oxidizing agents.

Special Fire-fighting Procedures: Isolate hazard area and deny entry. Since fire may produce toxic fumes, wear a self-contained breathing apparatus (SCBA) with a full facepiece operated in pressure-demand or positive-pressure mode, and full protective clothing. When the fire is extinguished, use nonsparking tools for cleanup. Be aware of runoff from fire control methods. Do not release to sewers or waterways.

Section 5. Reactivity Data

Stability/Polymerization: Automotive gasoline is stable at room temperature in closed containers under normal storage and handling conditions. Hazardous polymerization cannot occur.

Chemical Incompatibilities: Automotive gasoline can react with oxidizing materials such as peroxides, nitric acid, and perchlorates.

Conditions to Avoid: Avoid heat and ignition sources.

Hazardous Products of Decomposition: Thermal oxidative decomposition of automotive gasoline can produce oxides of carbon and partially oxidized hydrocarbons.

Section 6. Health Hazard Data

Carcinogenicity: In 1990 reports, the IARC list gasoline as a possible human carcinogen (Group 2B). Although the IARC has assigned an overall evaluation to gasoline, it has not assigned an overall evaluation to specific substances within this group (inadequate human evidence).
Summary of Risks: Gasoline vapors are considered moderately poisonous. Vapor inhalation can cause central nervous system (CNS) depression and mucous membrane and respiratory tract irritation. Brief inhalations of high concentrations can cause a fatal pulmonary edema. Reported responses to gasoline vapor concentrations are: 160 to 270 ppm causes eye and throat irritation in several hours; 500 to 900 ppm causes eye, nose, and throat irritation, and dizziness in 1 hr; and 2000 ppm produces mild anesthesia in 30 min. Higher concentrations are intoxicating in 4 to 10 minutes. If large areas of skin are exposed to gasoline, toxic amounts may be absorbed. Repeated or prolonged skin exposure causes dermatitis. Certain individuals may develop hypersensitivity. Ingestion can cause CNS depression. Pulmonary aspiration after ingestion can cause severe pneumonitis. In adults, ingestion of 20 to 50 g gasoline may produce severe symptoms of poisoning.
Medical Conditions Aggravated by Long-Term Exposure: None reported.
Target Organs: Skin, eye, respiratory and central nervous systems.
Primary Entry Routes: Inhalation, ingestion, skin contact.
Acute Effects: Acute inhalation produces intense nose, throat, and lung irritation; headaches; blurred vision; conjunctivitis; flushing of the face; mental confusion; staggering gait; slurred speech; and unconsciousness, sometimes with convulsions. Ingestion causes inebriation (drunkenness), vomiting, dizziness, fever, drowsiness, confusion, and cyanosis (a blue to dark purplish coloration of skin and mucous membrane caused by lack of oxygen). Aspiration causes choking, cough, shortness of breath, increased rate of respiration, excessively rapid heartbeat, fever, bronchitis, and pneumonitis. Other symptoms following acute exposure include acute hemorrhage of the pancreas, fatty degeneration of the liver and kidneys, and passive congestion of spleen.
Chronic Effects: Chronic inhalation results in appetite loss, nausea, weight loss, insomnia, and unusual sensitivity (hyperesthesia) of the distal extremities followed by motor weakness, muscular degeneration, and diminished tendon reflexes and coordination. Repeated skin exposure can cause blistering, drying, and lesions.
FIRST AID
Eyes: Gently lift the eyelids and flush immediately and continuously with flooding amounts of water until transported to an emergency medical facility. Consult a physician immediately.
Skin: *Quickly* remove contaminated clothing. Rinse with flooding amounts of water for at least 15 min. For reddened or blistered skin, consult a physician. Wash affected area with soap and water.
Inhalation: Remove exposed person to fresh air and support breathing as needed.
Ingestion: Never give anything by mouth to an unconscious or convulsing person. If ingested, *do not induce vomiting* due to aspiration hazard. Give conscious victim a mixture of 2 tablespoons of activated charcoal mixed in 8 oz of water to drink. Consult a physician immediately.
After first aid, get appropriate in-plant, paramedic, or community medical support.

Section 7. Spill, Leak, and Disposal Procedures

Spill/Leak: Notify safety personnel, evacuate all unnecessary personnel, remove heat and ignition sources, and provide maximum explosion-proof ventilation. Cleanup personnel should protect against vapor inhalation and liquid contact. Use nonsparking tools. Take up small spills with sand or other noncombustible adsorbent. Dike storage areas to control leaks and spills. Follow applicable OSHA regulations (29 CFR 1910.120).
Aquatic Toxicity: Bluegill, freshwater, LC_{50}, 8 ppm/96 hr.
Disposal: Contact your supplier or a licensed contractor for detailed recommendations. Follow applicable Federal, state, and local regulations.
EPA Designations
RCRA Hazardous Waste (40 CFR 261.21): Characteristic of ignitability
CERCLA Hazardous Substance (40 CFR 302.4): Not listed
SARA Extremely Hazardous Substance (40 CFR 355): Not listed
SARA Toxic Chemical (40 CFR 372.65): Not listed
OSHA Designations
Listed as an Air Contaminant (29 CFR 1910.1000, Table Z-1-A)

Section 8. Special Protection Data

Goggles: Wear protective eyeglasses or chemical safety goggles, per OSHA eye- and face-protection regulations (29 CFR 1910.133). Since contact lens use in industry is controversial, establish your own policy.
Respirator: Seek professional advice prior to respirator selection and use. Follow OSHA respirator regulations (29 CFR 1910.134) and, if necessary, wear a NIOSH-approved respirator. There are no specific NIOSH recommendations. However, for vapor concentrations not immediately dangerous to life or health, use chemical cartridge respirator equipped with organic vapor cartridge(s), or a supplied-air respirator. For emergency or nonroutine operations (cleaning spills, reactor vessels, or storage tanks), wear an SCBA. *Warning! Air-purifying respirators do not protect workers in oxygen-deficient atmospheres.*
Other: Wear impervious gloves, boots, aprons, and gauntlets to prevent prolonged or repeated skin contact. Materials such as neoprene or polyvinyl alcohol provide excellent/good resistance for protective clothing. Note: Resistance of specific materials can vary from product to product.
Ventilation: Provide general and local explosion-proof exhaust ventilation systems to maintain airborne concentrations below the OSHA PELs (Sec. 2). Local exhaust ventilation is preferred since it prevents contaminant dispersion into the work area by controlling it at its source.[NIOSH]
Safety Stations: Make available in the work area emergency eyewash stations, safety/quick-drench showers, and washing facilities.
Contaminated Equipment: Remove this material from your shoes and equipment. Launder contaminated clothing before wearing.
Comments: Never eat, drink, or smoke in work areas. Practice good personal hygiene after using this material, especially before eating, drinking, smoking, using the toilet, or applying cosmetics.

Section 9. Special Precautions and Comments

Storage Requirements: Store in closed containers in a cool, dry, well-ventilated area away from heat and ignition sources and strong oxidizing agents. Protect containers from physical damage. Avoid direct sunlight. Storage must meet requirements of OSHA Class IB liquid. Outside or detached storage preferred.
Engineering Controls: Avoid vapor inhalation and skin or eye contact. Consider a respiratory protection program that includes regular training, maintenance, inspection, and evaluation. Indoor use of this material requires explosion-proof exhaust ventilation to remove vapors. Only use gasoline as a fuel source due to its volatility and flammable/explosive nature. Practice good personal hygiene and housekeeping procedures. Wear clean work clothing daily.

Transportation Data (49 CFR 172.101, .102)

DOT Shipping Name: Gasoline (*including casing-head and natural*)
DOT Hazard Class: Flammable liquid
ID No.: UN1203
DOT Label: Flammable liquid
DOT Packaging Exceptions: 173.118
DOT Packaging Requirements: 173.119

IMO Shipping Name: Gasoline
IMO Hazard Class: 3.1
ID No.: UN1203
IMO Label: Flammable liquid
IMDG Packaging Group: II

MSDS Collection References: 26, 73, 89, 100, 101, 103, 124, 126, 127, 132, 133, 136, 138, 140, 143, 146, 153, 159
Prepared by: M Allison, BS, Industrial Hygiene Review: DJ Wilson, CIH; Medical Review: W Silverman, MD; Edited by: JR Stuart, MS

DOD Hazardous Materials Information System
DoD 6050.5-L
AS OF July 1995

FSC: 6850
NIIN: 001352878
Manufacturer's CAGE: 71983
Part No. Indicator: A
Part Number/Trade Name: ANTIFREEZE ETHYLENE GLYCOL (BULK,839E)

General Information

Item Name: ANTIFREEZE
Company's Name: DOW CHEMICAL U.S.A.
Company's Street: 2020 DOW CENTER
Company's P. O. Box:
Company's City: MIDLAND
Company's State: MI
Company's Country:
Company's Zip Code: 48674
Company's Emerg Ph #: 517-636-4400
Company's Info Ph #: 517-636-4410
Distributor/Vendor # 1:
Distributor/Vendor # 1 Cage:
Distributor/Vendor # 2:
Distributor/Vendor # 2 Cage:
Distributor/Vendor # 3:
Distributor/Vendor # 3 Cage:
Distributor/Vendor # 4:
Distributor/Vendor # 4 Cage:
Safety Data Action Code:
Safety Focal Point: D
Record No. For Safety Entry: 002
Tot Safety Entries This Stk#: 002
Status: SM
Date MSDS Prepared: 21DEC88
Safety Data Review Date: 04MAY89
Supply Item Manager: CX
MSDS Preparer's Name:
Preparer's Company:
Preparer's St Or P. O. Box:
Preparer's City:
Preparer's State:
Preparer's Zip Code:
Other MSDS Number:
MSDS Serial Number: BGVQC
Specification Number: NONE
Spec Type, Grade, Class:
Hazard Characteristic Code: N1
Unit Of Issue: DR
Unit Of Issue Container Qty: 55 GAL
Type Of Container: STD COML DRUM
Net Unit Weight: 513 LBS

Report for NIIN: 001352878

NRC/State License Number:
Net Explosive Weight:
Net Propellant Weight-Ammo:
Coast Guard Ammunition Code:

Ingredients/Identity Information

Proprietary: NO
Ingredient: ETHYLENE GLYCOL (SARA III)
Ingredient Sequence Number: 01
Percent: >90
Ingredient Action Code:
Ingredient Focal Point: D
NIOSH (RTECS) Number: KW2975000
CAS Number: 107-21-1
OSHA PEL: C 50 PPM
ACGIH TLV: C 50 PPM,VAPOR; 9192
Other Recommended Limit:

Proprietary: NO
Ingredient: DIETHYLENE GLYCOL
Ingredient Sequence Number: 02
Percent: <5
Ingredient Action Code:
Ingredient Focal Point: D
NIOSH (RTECS) Number: ID5950000
CAS Number: 111-46-6
OSHA PEL: N/K
ACGIH TLV: N/K
Other Recommended Limit:

Proprietary: NO
Ingredient: INHIBITORS
Ingredient Sequence Number: 03
Percent: >2
Ingredient Action Code:
Ingredient Focal Point: D
NIOSH (RTECS) Number: 1000602IN
CAS Number:
OSHA PEL: N/K
ACGIH TLV: N/K
Other Recommended Limit:

Proprietary: NO
Ingredient: WATER
Ingredient Sequence Number: 04
Percent: <3
Ingredient Action Code:
Ingredient Focal Point: D
NIOSH (RTECS) Number: ZC0110000
CAS Number: 7732-18-5
OSHA PEL: N/R
ACGIH TLV: N/R

Report for NIIN: 001352878

Other Recommended Limit:

Physical/Chemical Characteristics

Appearance And Odor: LIQUID,COLORED AT CUSTOMER REQUEST.
Boiling Point: 330F, 166C
Melting Point: N/K
Vapor Pressure (MM Hg/70 F): VERY LOW
Vapor Density (Air=1): >1
Specific Gravity: 1.11 TO 1.14
Decomposition Temperature: N/K
Evaporation Rate And Ref: (BUTYL ACETATE=1)
Solubility In Water: COMPLETE
Percent Volatiles By Volume: N/K
Viscosity: N/K
pH: N/K
Radioactivity:
Form (Radioactive Matl):
Magnetism (Milligauss): N/P
Corrosion Rate (IPY): N/K
Autoignition Temperature: 775F

Fire and Explosion Hazard Data

Flash Point: >247F,>119C
Flash Point Method: SCC
Lower Explosive Limit: N/K
Upper Explosive Limit: N/K
Extinguishing Media: CARBON DIOXIDE,ALCOHOL FOAM,DRY CHEMICAL, WATER FOG.
Special Fire Fighting Proc: EVACUATE AREA, WEAR FIRE FIGHTING PROTECTIVE EQUIPMENT AND SCBA. COOL FIRE EXPOSED CONTAINERS WITH WATER SPRAY.
Unusual Fire And Expl Hazrds: NONE EXPECTED UNDER NORMAL STORAGE AND HANDLING CONDITIONS;HOWEVER, ENGINE COMPONENTS CAN BE AT TEMPERATURES ABOVE THE FLASH, FIRE AND AUTOIGNITION POINT.

Reactivity Data

Stability: YES
Cond To Avoid (Stability): HIGH HEAT. ETHYLENE GLYCOL WILL IGNITE IN AIR AT 775F. DIETHYLENE GLYCOL WILL IGNITE IN AIR AT 435F.
Materials To Avoid: OXIDIZING MATERIAL.
Hazardous Decomp Products: DURING COMBUSTION, CARBON MONOXIDE, CARBON DIOXIDE AND UNIDENTIFIED TOXIC FUMES AND/OR VAPORS.
Hazardous Poly Occur: NO
Conditions To Avoid (Poly): N/R

Health Hazard Data

LD50-LC50 Mixture: SINGLE DOSE ORAL LD50 NOT DETERMINED
Route Of Entry - Inhalation: YES
Route Of Entry - Skin: YES
Route Of Entry - Ingestion: YES
Health Haz Acute And Chronic: EXCESSIVE EXPOSURE MAY CAUSE IRRITATION TO

UPPER RESPIRATORY TRACT. OBSERVATIONS IN ANIMALS INCLUDE FORMATION OF BLADDER STONES AFTER REPEATED ORAL DOSES OF DIETHYLENE GLYCOL. OBSERVATIONS IN ANIMALS INCLUDE KIDNEY AND LIVER EFFECTS AND DEPOSITION OF CALCIUM SALTS IN TISSUES AFTER DIETARY INTAKE OF ETHYLENE GLYCOL.
Carcinogenicity - NTP: NO
Carcinogenicity - IARC: NO
Carcinogenicity - OSHA: NO
Explanation Carcinogenicity: NONE OF THE COMPOUNDS IN THIS CHEMICAL IS LISTED BY IARC,NTP OR OSHA AS A CARCINOGEN.
Signs/Symptoms Of Overexp: EYE:MAY CAUSE TEMPORARY IRRITATION. SKIN: NONIRRITATING. REPEATED EXPOSURE MAY RESULT IN ABSORPTION OF HARMFUL AMOUNTS. INGESTION: MODERATELY TOXIC. EXCESSIVE AMOUNTS MAY CAUSE CNS EFFECTS, CARDIO-PULMONARY EFFECTS & KIDNEY FAILURE. INHALATION: HEATED VAPORS MAY CAUSE IRRITATION & OTHER EFFECTS.
Med Cond Aggravated By Exp: NONE.
Emergency/First Aid Proc: INHALATION: REMOVE TO FRESH AIR. IF NOT BREATHING GIVE CPR. CALL A PHYSICIAN. SKIN: WASH SKIN WITH SOAP AND WATER. REMOVE CONTAMINATED CLOTHING. EYE: IMMEDIATELY FLUSH EYES WITH PLENTY OF WATER FOR AT LEAST 15 MINUTES. CALL A PHYSICIAN. INGESTION: INDUCE VOMITING. IF CONSCIOUS, GIVE LARGE QUANTITIES OF WATER TO DRINK. GIVE NOTHING BY MOUTH IF UNCONSCIOUS. CALL A PHYSICIAN.

Precautions for Safe Handling and Use

Steps If Matl Released/Spill: SMALL SPILL: ABSORB ON SAND OR OTHER NON-COMBUSTIBLE ABSORBANT. PLACE IN DISPOSAL CONTAINER. LARGE SPILL: EVACUATE AREA. VENTILATE AREA. ELIMINATE IGNITION SOURCES. DIKE TO RETAIN SPILL. PICK UP FREE LIQUID WITH PUMP OR VACUUM. ABSORB RESIDUE.
Neutralizing Agent: NONE RECOMMENDED.
Waste Disposal Method: DISPOSE IN ACCORDANCE WITH ALL APPLICABLE FEDERAL, STATE AND LOCAL REGULATIONS AND LAWS. INCINERATION RECOMMENDED.
Precautions-Handling/Storing: STORE IN COOL,DRY AREA. KEEP CONTAINER TIGHTLY CLOSED WHEN NOT IN USE. PROTECT FROM PHYSICAL DAMAGE.
Other Precautions: AVOID BREATHING SPRAY MISTS IF GENERATED.

Control Measures

Respiratory Protection: SELECT NIOSH/MSHA APPROVED RESPIRATOR BASED UPON CONTAMINATION LEVELS FOUND IN THE WORK PLACE.
Ventilation: LOCAL AND MECHANICAL (GENERAL) VENTILATION AS REQUIRED TO MAINTAIN VAPOR AND MIST CONCENTRATIONS BELOW PELS EST. BY OSHA
Protective Gloves: RUBBER (IMPERVIOUS).
Eye Protection: SAFETY GLASSES OR SAFETY GOGGLES.
Other Protective Equipment: EYE WASH STATION, CLEAN BODY-COVERING CLOTHING.
Work Hygienic Practices: WASH THOROUGHLY AFTER USE AND BEFORE EATING, DRINKING OR SMOKING. LAUNDER CONTAMINATED CLOTHING BEFORE REUSE.
Suppl. Safety & Health Data: NSN 6850-00-181-7940 IS A RELATED PRODUCT. SEE MSDS UNDER THAT NSN FOR ADDITIONAL INFORMATION ON ANTIFREEZE IAW MIL-A-46153.

Report for NIIN: 002614160

Materials To Avoid: STRONG MINERAL ACIDS, ALUMINUM CHLORIDE, BORON TRIFLUORIDE
Hazardous Decomp Products: N/K
Hazardous Poly Occur: NO
Conditions To Avoid (Poly): N/K

Health Hazard Data

LD50-LC50 Mixture: N/K
Route Of Entry - Inhalation: N/P
Route Of Entry - Skin: N/P
Route Of Entry - Ingestion: N/P
Health Haz Acute And Chronic: HEADACHE AND DIZZINESS
Carcinogenicity - NTP: N/P
Carcinogenicity - IARC: N/P
Carcinogenicity - OSHA: N/P
Explanation Carcinogenicity: N/K
Signs/Symptoms Of Overexp: HEADACHE AND DIZZINESS
Med Cond Aggravated By Exp: N/K
Emergency/First Aid Proc: EYES: FLUSH WITH WATER FOR 15 MINUTES, CALL PHYSICIAN. SKIN: REMOVE CONTAMINATED CLOTHING. WASH WITH SOAP AND WATER. INHALATION: REMOVE VICTIM FROM CONTAMINATED AREA. ADMINISTER ARTIFICIAL RESPIRATION IF NECESSARY, CALL PHYSICIAN.

Precautions for Safe Handling and Use

Steps If Matl Released/Spill: REMOVE SOURCE OF IGNITION. NO SMOKING. FLUSH AWAY SMALL SPILLS WITH WATER. PUMP LARGE SPILLS TO SALVAGE TANK.
Neutralizing Agent: N/K
Waste Disposal Method: INCINERATE. DISPOSE OF IN ACCORDANCE WITH GOVERNMENT REGULATIONS
Precautions-Handling/Storing: WARNING! FLAMMABLE. KEEP AWAY FROM OPEN FLAME.
Other Precautions: N/K

Control Measures

Respiratory Protection: SELF-CONTAINED OR AIR-LINE BREATHING APPARATUS. IN HIGH VAPOR CONCENTRATIONS.
Ventilation: PREFERRED
Protective Gloves: N/K
Eye Protection: CHEMICAL-SPLASH SAFETY GOGGLES
Other Protective Equipment: N/K
Work Hygienic Practices: N/K
Suppl. Safety & Health Data: N/K

Report for NIIN: 002614160

NRC/State License Number: N/K
Net Explosive Weight: N/K
Net Propellant Weight-Ammo: N/K
Coast Guard Ammunition Code: N/K

Ingredients/Identity Information

Proprietary: NO
Ingredient: TURPENTINE
Ingredient Sequence Number: 01
Percent: 100
Ingredient Action Code:
Ingredient Focal Point: G
NIOSH (RTECS) Number: YO8400000
CAS Number: 8006-64-2
OSHA PEL: 100 PPM
ACGIH TLV: 100 PPM; 9192
Other Recommended Limit: NONE SPECIFIED

Physical/Chemical Characteristics

Appearance And Odor: COLORLESS LIQUID, PINEY ODOR
Boiling Point: 307F,153C
Melting Point: N/K
Vapor Pressure (MM Hg/70 F): 4 MMHG
Vapor Density (Air=1): N/K
Specific Gravity: 0.864
Decomposition Temperature: N/K
Evaporation Rate And Ref: 1 (BUTYL ACETATE=1)
Solubility In Water: NEGLIGIBLE
Percent Volatiles By Volume: 99
Viscosity: N/K
pH: N/K
Radioactivity: N/K
Form (Radioactive Matl):
Magnetism (Milligauss): N/P
Corrosion Rate (IPY): N/K
Autoignition Temperature: 488F

Fire and Explosion Hazard Data

Flash Point: 105 F/41 C
Flash Point Method: TCC
Lower Explosive Limit: 0.8
Upper Explosive Limit: N/K
Extinguishing Media: WATER FOG, FOAM, DRY CHEMICAL, CARBON DIOXIDE
Special Fire Fighting Proc: COOL CONTAINERS WITH WATER IF EXPOSED TO FIRE
Unusual Fire And Expl Hazrds: N/K

Reactivity Data

Stability: YES
Cond To Avoid (Stability): N/K

DOD Hazardous Materials Information System
DoD 6050.5-L
AS OF July 1995

FSC: 8010
NIIN: 002614160
Manufacturer's CAGE: 5W216
Part No. Indicator: A
Part Number/Trade Name: TURPENTINE

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General Information

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Item Name: TURPENTINE
Company's Name: CHEMICAL SPECIALISTS & DEVELOPMENT
Company's Street: #5 HACKBERRY LANE
Company's P. O. Box: N/K
Company's City: CUT & SHOOT
Company's State: TX
Company's Country: US
Company's Zip Code: 77303
Company's Emerg Ph #: 800-424-9300
Company's Info Ph #: 409-756-1065
Distributor/Vendor # 1:
Distributor/Vendor # 1 Cage:
Distributor/Vendor # 2:
Distributor/Vendor # 2 Cage:
Distributor/Vendor # 3:
Distributor/Vendor # 3 Cage:
Distributor/Vendor # 4:
Distributor/Vendor # 4 Cage:
Safety Data Action Code:
Safety Focal Point: G
Record No. For Safety Entry: 001
Tot Safety Entries This Stk#: 004
Status: SM
Date MSDS Prepared: 01OCT90
Safety Data Review Date: 06DEC90
Supply Item Manager: GSA
MSDS Preparer's Name: DAVID SHIPP
Preparer's Company: CHEMICAL SPECIALISTS & DEVELOPMENT
Preparer's St Or P. O. Box: #5 HACKBERRY LANE
Preparer's City: CUT & SHOOT
Preparer's State: TX
Preparer's Zip Code: 77303
Other MSDS Number:
MSDS Serial Number: BHDDP
Specification Number: N/K
Spec Type, Grade, Class: N/K
Hazard Characteristic Code:
Unit Of Issue: QT
Unit Of Issue Container Qty: 1 QT CAN
Type Of Container: METAL
Net Unit Weight: N/K

APPENDIX II

SITE SAMPLING RESULTS

MEA

BELING CONSULTANTS

Professional Engineering and Environmental Services

cc: PWC
EA BrCL

September 16, 1996

Department of the Navy
Engineering Field Activities
Midwest Code O23B
Naval Facilities Engineering Command, Bldg. 1-A
2703 Sheridan Road, Suite #120
Great Lakes, Illinois 60088-5600

Attn: Tony Andrews, Project Engineer and Technical Specialist

SUBJECT: LETTER REPORT
LABORATORY ANALYTICAL RESULTS
OF LIMITED FIELD SAMPLING
WASTE CHARACTERIZATION PRIOR TO
REMOVAL OF FUEL AND WATER DISTRIBUTION PIPING
FFTU FACILITY CONTRACT #N 68950-95-D-9021

Dear Mr. Andrews:

As authorized, a limited number of field samples were collected and analyzed for trace amount of compounds including volatiles, semi-volatiles, metals, pesticides, herbicides, and PCBs. Some sample jars collected on August 2, 1996 broke in shipment to Hazelton Laboratory Services, a CLP laboratory, and additional samples were collected and sent to the laboratory on August 9, 1996. Preliminary results of analytical testing were compiled and provided to you on August 27, 1996. Hazelton Laboratory has furnished a hard copy of completed laboratory reports for the samples submitted to them in August. This letter report provides results of Beling Consultants' (Beling's) evaluation of those report forms in tabular format. The attached tables provide the sample locations across the top from left to right. The compounds which were detected above the instrument detection level for the method used are provided in the furthest left-hand column.

Some samples were analyzed as solids and some samples were analyzed as liquid, therefore the results are separated as either parts per billion, or micrograms per liter (equivalent).

Compounds which were targeted but not detected ("U"), were not provided in the table. The table does include all data qualifiers provided in laboratory reports such as "B" and

"J". For inorganic parameters, the "B" denotes that a reported value was obtained from a reading that was less than the contract required detection limit, but greater than or equal to the instrument detection limit; for organic parameters, "B" has been included on the tables and means that the analyte is found in the associated blank as well as in the sample. The concentrations of constituents detected in the blank are not provided in the table, however, all of the laboratory QA/QC data is attached as Appendix A for reference. Note that the other data qualifiers, such as those denoting inconsistencies with QA/QC review, were not noted as a problem.

Sample locations were previously identified in a work plan which was reviewed and approved by the Engineer in Charge and the State and Federal Regulatory Agencies. A brief summary of sample locations is provided below.

Sample #1 Sludge collected from a concrete vault downstream of the oil/water separator. The sample collection point is associated with discharge piping to the former settlement ponds.

Sample #2 A water sample collected from the east side of the oil/water separator pit which had approximately eight feet of standing water in a twelve foot concrete vault. The oil/water separator pits are somewhat sheltered from precipitation, therefore the water is believed to be sourced from a network of underground cast iron drainage lines.

Sample #3 Water collected from the west side of the oil/water separator pit. This sample location is believed to be in hydraulic connection with sample location #2 above.

Samples #4 and #5 Sample #4 was omitted due to reports from the environmental department, which indicated the underground storage tank (UST) to be sampled for sample #4 had been removed in 1988. Sample #5 is comprised mostly of free product believed to be diesel. The tank is located near the entrance on the west-southwest portion of the property. Field observations indicated that water was present inside the tank below the free product.

Samples #6 and #7 The USTs believed to be located in the central but eastern portion of the site were targeted to provide samples of product. A limited geophysical

survey using a magnetometer, Model EM-31, appeared to indicate an anomaly in the area of the tanks. Fill pipes were not observed from the surface because plan drawings indicate remote fill lines and an extensive array of field distribution piping. A backhoe was used to perform limited shallow excavation in an attempt to open the tops of the tanks to facilitate field sampling. The backhoe encountered pipes, but no tanks. Groundwater was encountered between 2½ and 3 feet below grade. A sample of the standing water with apparent hydrocarbon contamination was collected and designated as UST excavation water, sample #7.

Sample #8 Dirt collected from a christmas tree square, former surface impoundment, located closest to the FFTU classroom training facility. Dirt was collected from the drain within this square impoundment area.

Sample #9 Water collected from the circular burn pan, or burn pit closest to the FFTU classroom facility. Water which appeared to be heavy with biomass and vegetative matter was collected, and subsequently extracted by the laboratory into a solid substance. The results are, therefore, reported as a solid. The substantial accumulation of water within this burn pan indicates that the drainage line is plugged, or that the valve to the drain is closed.

Sample #10 Dirt collected from the floor drain within the carrier compartment closest to the FFTU classroom building. A eight-inch diameter floor drain grate was removed to facilitate sample collection.

Sample #11 Wipe samples from floor of the carrier compartment building closest to the FFTU classroom building. A template of 100 square centimeters and a wipe cloth dampened with hexane were utilized to obtain the wipe sample. The cloth was vigorously rubbed from side to side and up and down within the 100 square centimeter template area. The wipe sample was analyzed for semi-volatiles and PCBs only, rather than the full suite of chemical analyses used for the other samples.

Sample #12 Wipe sample from the south wall of the carrier compartment building located closest to the FFTU classroom building. This wipe samples was obtained in the same way and analyzed for the same parameters as described for sample #11 above.

Sample #13 A sludge sample intended to serve as a duplicate of sample #1, both of which were collected downstream of the oil/water separator in a concrete vault. The results for sample #13 are provided next to the results of sample #1 in the attached tables.

Table #1 provides the analytical results for parameters including metals, organic pesticides/PCBs and herbicides. The results for metals are separated into two separate sections, one for solids or soils, and one for water or groundwater. As previously stated, all results are provided in parts per billion (ppb) equivalent. Analytes not detected are not provided in the tables.

Don Harrison of the Illinois Environmental Protection Agency (IEPA) and Laura Ripley of United States Environmental Protection Agency (USEPA) have both indicated that the presence of metals in soil and groundwater has been anticipated and is not a regulatory concern at this time.

PCBs were not detected in any of the samples. Lindane was detected in the oil/water separator. It is believed to be associated with the Navy's louse insecticide powder NSN 6840-00-242-4271. Three pages copied from the Manual of Naval Preventative Medicine are provided with this report as Appendix B.

Pesticides such as 4,4-DDD, Beta-BHC, and 4,4-DDE were detected in the drain samples. Heptachlor, Dieldrin, and Gamma Chlordane were detected in the sludge along with other insecticides mentioned above. Aldrin and Beta-BHC were detected in the diesel sample.

Herbicides such as 2,4-D, Silvex, and 2,4-DB were detected in the sludge and carrier drain dirt.

The source of some of the pesticides and herbicides may be related to the maintenance of the golf course which surrounds the FFTU facility.

Table #2 provides the analytical results of volatile organic compounds for the locations tested. Again, the results separated solids/soils from water/groundwater. The results of some volatiles indicate a "B" and/or "J" which implies a decreased confidence level or a decreased level of concern related to the presence of those compounds. Those compounds detected and provided in Table #2 are discussed below.

Methylene Chloride: a common laboratory contaminant. Not of specific regulatory concern regarding the removal of the fuel lines or remediation of the other specific locations sampled.

Xylene, toluene, naphthalene: common components of fuel.

1,2,4-trichlorobenzene: potential uses or sources: lubricant, insecticides per Hawley's Condensed Chemical Dictionary, eleventh edition.

1,2-dibromo-3-chloropropane: an additive to pesticides, presumably a dispersant. Source of information, closure documentation prepared for Fort Sheridan.

Benzene, ethylbenzene, isopropybenzene, and N-propybenzene: common components of fuel.

1,2,4 trimethlylbenzene: a component of lubricants and also known to be a fuel component. Source Dictionary of Chemical Names & Synonyms, Lewis Publishers.

1,3,5 trimethylbenzene: insoluble in water, derivative of coal tar per Hawley's.

Trichlorofloromethane: an agent used in fire extinguishers per Hawley's.

Other compounds not otherwise noted are not of apparent regulatory concern at this time. Donald Harrison of IEPA has expressed an interest in identifying the source or potential sources for the compounds detected above.

Table 3 provides the results of analysis for semi-volatile organic compounds from solids or soil samples. Many of the chemicals listed on this table are within the polynuclear aromatic hydrocarbon chemical class. PNAs are often a byproduct of combustion of organic matter and their presence at this site is attributable to the burning of fuel. Benzo(a)pyrene is the only carcinogenic PNA to be detected during this analytical study. It was noted in the drain samples from christmas tree square and the carrier compartment, in the material extracted from water in the burn pit, and in a wipe sample from the carrier compartment wall.

Dibenzofuran was detected in the sludge samples, and the drains of the christmas tree square and the carrier compartment. The source of dibenzofuran is believed to be insecticides, source: Hawley's.

Table #4 provides the analytical results of semi-volatile organic compounds in water/ groundwater samples. Non-carcinogenic PNAs were detected in the oil/water separator, the diesel product, and the groundwater collected near the location of former fuel tanks.

I trust that the information provided by the field sampling and this analytical summary are useful in the determination of additional field screening and cleanup objectives for the FFTU site.

Sincerely,

BELING CONSULTANTS, INC.

Molly E. Arp, Geologist, CHMM
Manager - Environmental Compliance

kjy

cc: Laura Ripley, USEPA w/attachments
Don Harison, IEPA w/attachments
Beling's FFTU Project Team w/o attachments
File #29648

LAB SUMMARY TABLES 1→4 to FWL
KEM
PAR
9/20/96

RESULTS OF ANALYTICAL TESTING
FFTU PRELIMINARY SCREENING
compounds shown were detected greater than "contract required" detection limits
Reported in parts per billion (ppb)

TABLE 1

Catagory and Compound	TACO #s (assume Class I G.W.)	SAMPLING LOCATIONS No. 1 Sludge Down St	No. 13 Dupl. of No. 1	No. 2 O/W H2O	No.3 O/W H2O	No.5 Diesel Product	No.7 UST Exc H2O	No. 8 C.T. Sq Dirt	No.9 Burn pit Biosolid	No.10 Carrier drain dirt	No.11 Wipe floor	No.12 Wipe Wall	Note N0.
Date Collected		8-2-96	8-2-96	8-9-96	8-9-96	8-9-96	8-9-96	8-2-96	8-2-96	8-2-96	8-2-96	8-2-96	
Metals Solids/soil		X	X					X	X	X			
Arsenic	15 ppb									50.5			
Barium	26 ppb	2450	1020					1380	49.2	153			
Cadmium	2 ppb							9.07	3.42	13.7			
Chromium	20 ppb	53.8	24.1					254	1250	32.6			
Selenium	3 ppb									3.22			
Thallidium	0.3 ppb	0.711	0.641					0.667	2.35	0.645			
Metals Water/GW				X	X	X	X						
Iron	5.0			366	2460		1500						
Lead	0.0075			3.12	3.3								
Manganese	0.15			37	176		224						
Zinc	5.0			278	63.1		62.6						
Organics Pesticides/PCB		X	X	X	X	X	X	X	X	X	PCBs only	PCBs only	
Gamma-BHC (Lindane)	0.006				0.070								
Heptachlor	0.06	27											
Dieldrin	0.001	76	120										
4,4-DDD	1.0		36							720			
4,4 DDT diff.CAS #	1.0									380			
Beta-BHC		190	47			130		37	2.7	390			
Aldrin	0.005					11							
Gamma Chloridane	2	54	49										
4,4-DDE	0.5									690			
HERBICIDES		X	X	X	X	X	X	X	X	X			
2,4-D	1.7		630							440			
2,4,5-TP(Silvex)	2.7	35								690			
Pentachloro-phenol	0.01		26							300			
2,4, DB													
Dichloroprop										770			
Dinoseb										72			

NOTE: 1) Compounds not on tables which were detected in the blank
2) TACO Inorganic Cleanup Objectives for soil were taken from 135 IAC 742 Appendix B, Table C assuming pH of soil between 6.25 and 6.74.
3)TACO Cleanup Objectives for the other tables shown utilize residential and Class I groundwater parameters.

RESULTS OF ANALYTICAL TESTING
FFTU PRELIMINARY CAREENING
compounds shown were detected greater than "contract required" detection limits
Reported in parts per billion (ppb)

TABLE 2

Catagory and Compound	TACO #s (assume Class I G.W.)	SAMPLING LOCATIONS											Notes
		No. 1 Sludge Down St	No. 13 Dupl. of No. 1	No. 2 O/W H2O	No.3 O/W H2O	No.5 Diesel Product	No.7 UST Exc H2O	No. 8 C.T. Sq Dirt	No.9 Burn pit Biosolid	No.10 Carrier drain dirt	No.11 Wipe floor	No.12 Wipe Wall	
Date Collected		8-2-96	8-2-96	8-9-96	8-9-96	8-9-96	8-9-96	8-2-96	8-2-96	8-2-96	8-2-96	8-2-96	
Volatiles Solids/soil		X	X					X	X	X			
Methylene Chloride	0.01	2500BJ	890BJ					3BJ		28B			
Xylene	74	2500JX	1200JX							11X			
Toluene	5							0.9BJ		7BJ			
Naphthalene	30	6100BJ	4400B					2BJ					
1,2,4-Trichloro-benzene	2							2BJ	3BJ				
1,2-Dibromo-3-chloropropane	0.00061								3J				
Benzene	0.02									2J			
Ethylbenzene	5		310J										
Isopropylbenzene			220J										
n-Propylbenzene			670J										
1,2,4 Trimethyl benzene		8600	7600					2BJ	3BJ	21			
1,3,5 Trimethyl benzene		5500J	2600						7J	6J			
Trichlorofluro-methane								2J		12			

Volatile Water/GW				X	X	X	X						
Methylene chloride	5.0			2J	13		1J						
Benzene	5.0					10KJ	12						
Toluene	1,000					110K	66						
Ethylbenzene	700					120K	28						
Xylene	10,000					3400KX	94						
Isopropyl benzene						120K	9						
sec-Butyl benzene						210K	7						
n-Propyl benzene						90K	9						
1,3,5 Trimethyl benzene						150K	9						
1,2,4 Trimethyl benzene						630K	34						
p-Isopropyl toluene						500K	12						
Napthalene	25					410KB	72B						

Notes: K = times 1000

29646.QP.LAB646.WB1 TABLE UPDATED 9-3-96

RESULTS OF ANALYTICAL TESTING
FFTU PRELIMINARY SCREENING
compounds shown were detected greater than "contract required" detection limits
Reported in parts per billion (ppb)

TABLE 3

Catagory and Compound	TACO #s (assume Class I G.W.)	SAMPLING LOCATIONS											Notes
		No. 1 Sludge Down St	No. 13 Dupl. of No. 1	No. 2 O/W H2O	No.3 O/W H2O	No.5 Diesel Product	No.7 UST Exc H2O	No. 8 C.T. Sq Dirt	No.9 Burn pit Biosolid	No.10 Carrier drain dirt	No.11 Wipe floor	No.12 Wipe Wall	
Date Collected		8-2-96	8-2-96	8-9-96	8-9-96	8-9-96	8-9-96	8-2-96	8-2-96	8-2-96	8-2-96	8-2-96	
SEMI VOC SOLIDS/SOIL		X	X					X	X	X	X	X	
4-Methylphenol									1500J				
2,4-Dimethyl-phenol	3		460J										
Naphthalene	30	11000J	6500					650J		1300J			
2-Methyl-naphthhalene		100000	47000										
Acenaphthene	200	30000	9100					1600J		7800J			
4-Nirophenol		16000J											
Dibenzofuran		27000	5100					2200		11000J			
Diethylphthalate	110											20	
Fluorene	160							3600		19000			
Phenanthrene			41000					3400		15000			
Carbazole			2900J					620J	550J				
Di-n-Butyl-phthalate	100							23000					
Fluoranthene	980							3500		84000			
Pyrene	14000	21000J	7300					5400	4600J	68000		13J	
Butylbenzyl-phthalate	68								210J			0.7J	
Benzo (a)-Anthracene	0.7		860J					2400		20000		7J	
Chrysene	1.0	3000J	1500J					4000	2600J	21000		8J	
bis(2-Ethylgexyl) Phthalate	11	2900J	960J					2100J	1700J	15000		16J	
Di-n-Octyl Phthalate								2200	83J			0.3J	
Benzo (b) Fluoranthene	4		1800J					5800	4900J	55000		28	
Benzo (a) Pyrene	4		1100J					3000	2500J	34000		16J	
Indeno(1,2,3-cd) Pyrene	35		790J					2400	1500J	21000		13J	
Dibenzo (a,h) Anthracene	11							180J		4600J		1J	
Benzo (g,h,i) Perylene			820J						1800J	18000		11J	

29646.QP.LAB646.WB1 TABLE UPDATED 8-26-96

RESULTS OF ANALYTICAL TESTING
FFTU PRELIMINARY SCREENING
compounds shown were detected greater than "contract required"detection limits
Reported in parts per billion (ppb)

TABLE 4

Catagory and Compound	TACO #s (assume Class I G.W.)	SAMPLING LOCATIONS											Notes
		No. 1 Sludge Down St	No. 13 Dupl. of No. 1	No. 2 O/W H2O	No.3 O/W H2O	No.5 Diesel Product	No.7 UST Exc H2O	No. 8 C.T. Sq Dirt	No.9 Burn pit Biosolid	No.10 Carrier drain dirt	No.11 Wipe floor	No.12 Wipe Wall	
Date Collected		8-2-96	8-2-96	8-9-96	8-9-96	8-9-96	8-9-96	8-2-96	8-2-96	8-2-96	8-2-96	8-2-96	
SEMI VOC WATER/GW				X	X	X	X						
Naphthalene	0.025				2J	860KJ	260						
2-Methyl-naphthalene						6200K	1900						
Acenaphthene	0.42			7J	7J	1900KJ	240						
Dibenzofuran					10	2500K	230						
Diethylphthalate	5.6				10		210						
Fluorene	0.28			17	16		350						
4-Nitroaniline					2J								
Phenanthrene							310						
Carbazole					0.5J								
Pyrene	0.21			0.8J	0.4J	120KJ	86J						
bis(2-Ethylhexyl) phthalate	0.006			1J	1J								
Di-n-Octyl Phthalate					0.2J								

29646.QP.LAB646.WB1 TABLE UPDATED 9-3-96

APPENDIX III

ON-SITE CONTROL MAP

Controlled Perimeter

POND

LAYER 1

GENERAL ARRANGMENTS OF COMPONENTS

CARRIER COMPARTMENTS (TYP)

BURN PIT (TYP)

CHRISTMAS TREE (TYP)

D

C

B

A

NORTH DECANT POND

SOUTH DECANT POND

OVERFILL TANK

FORMER SLUDGE PIT

1,500 GALLON UNDERGROUND GASOLINE STORAGE TANK

2,500 GALLON UNDERGROUND OIL STORAGE TANK

FORMER SMOTHERING PIT

DUPLEX OIL SEPARATOR

FORMER SEPARATOR PIT

1,500 GALLON UNDERGROUND GASOLINE STORAGE TANKS

2,500 GALLON UNDERGROUND OIL STORAGE TANKS

2,500 GALLON UNDERGROUND OIL STORAGE TANK

STORAGE BUILDING

5,000 GALLON UNDERGROUND GASOLINE STORAGE TANK (REMOVED)

5,000 GALLON UNDERGROUND OIL STORAGE TANK (REMOVED)

2 ABOVEGROUND STORAGE TANK

FORMER FILLBOX

MAIN WATER SERVICE

HYDRANT

BOILER ROOM

3304 ADMINISTRATION BUILDING

CART STORAGE

GOLF COURSE

GOLF COURSE

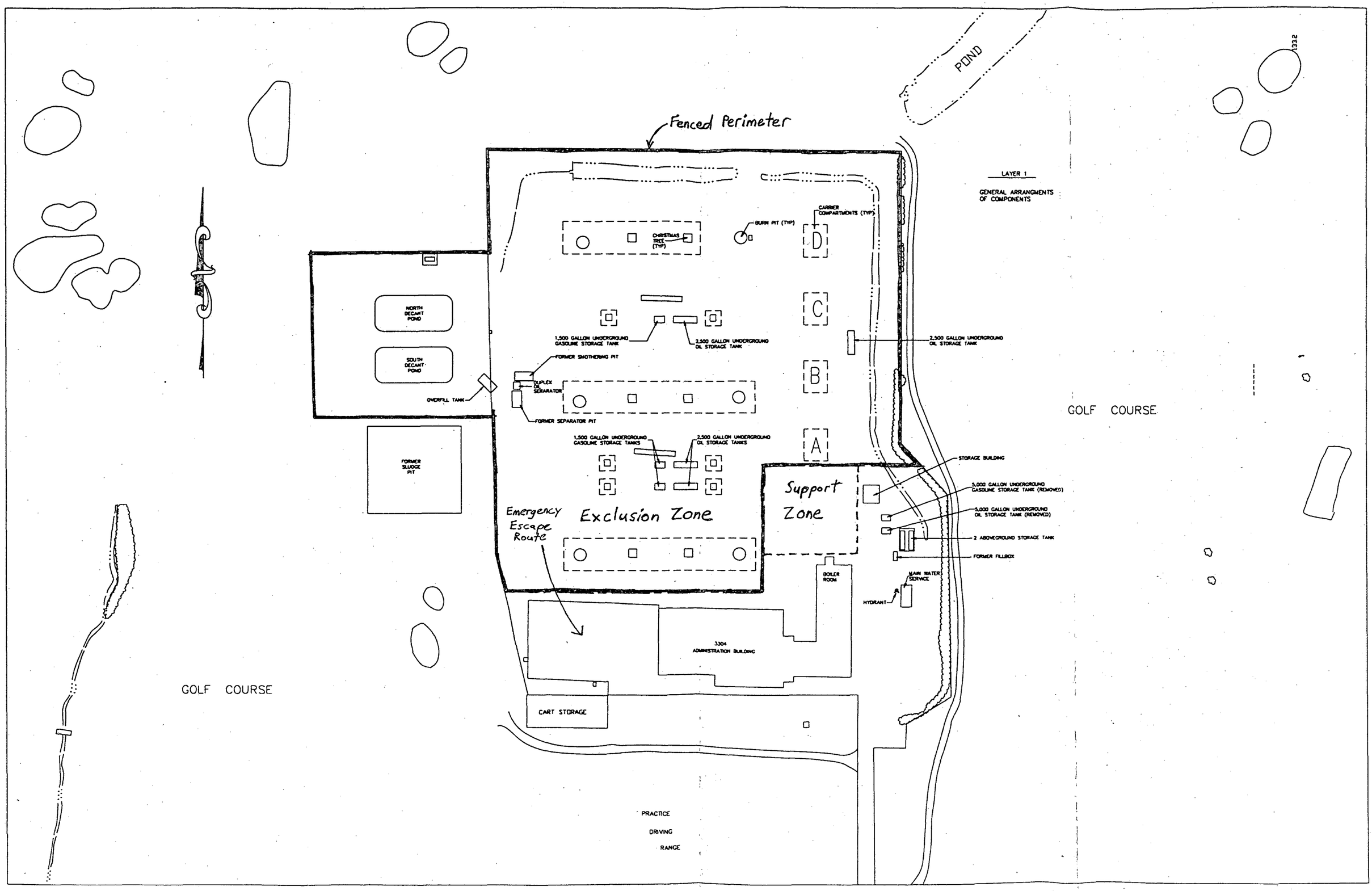
PRACTICE DRIVING RANGE

secured Gate

GLNTC FFTU PLAN VIEW (FIGURE 3-1) SCALE: TO FIT

APPENDIX IV

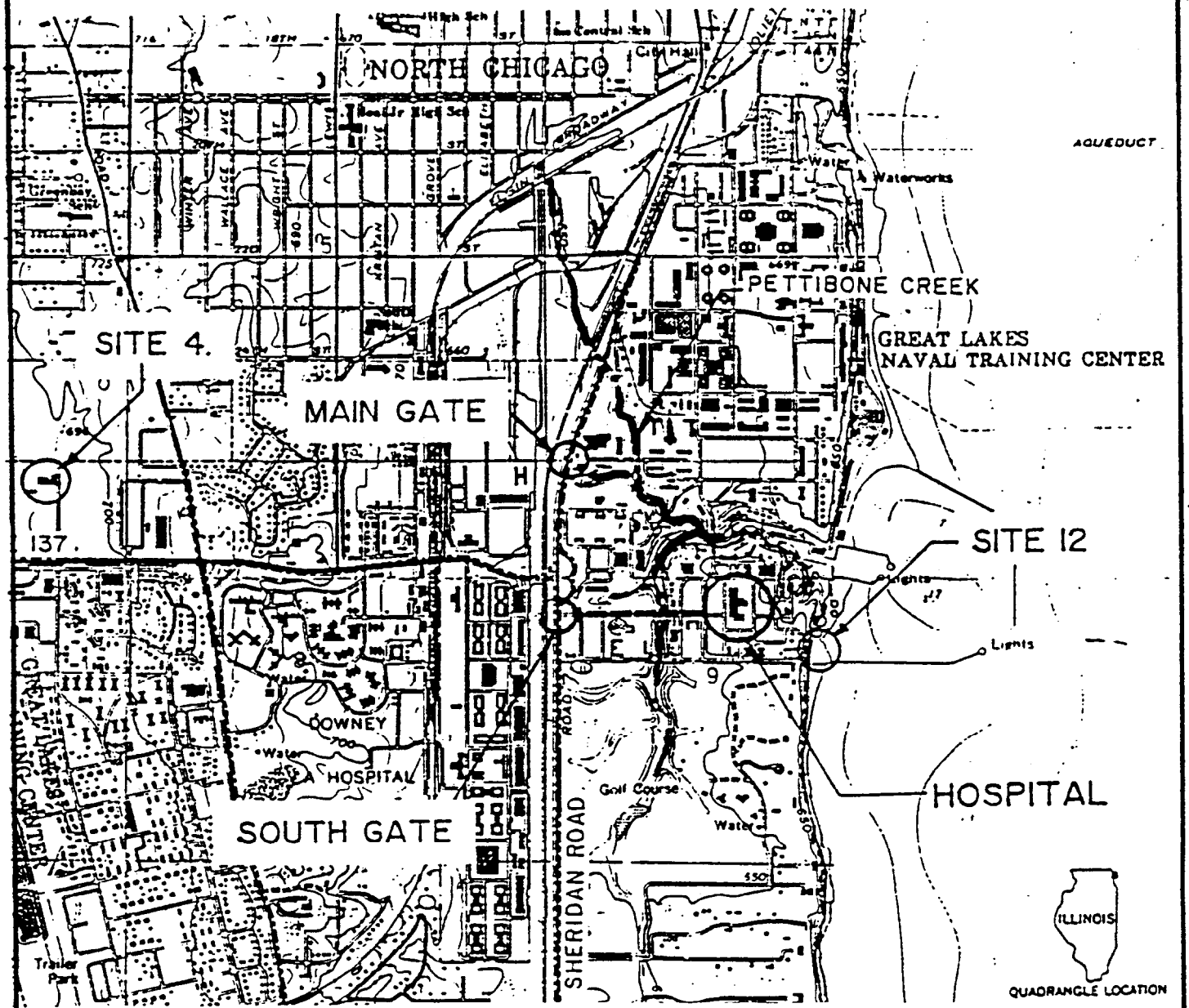
CONTROL BOUNDARIES MAP



GLNTC FFTU PLAN VIEW (FIGURE 3-1) SCALE: TO FIT

APPENDIX V

EMERGENCY HOSPITAL ROUTES



From FFTU Site 4, travel east on Buckley Road, south on 41, east on 137, south on Sheridan to hospital entrance

Great Lakes Naval Hospital
Ambulance: 847-688-3333
Emergency Room: 847-688-6855 or 6856

N

0 2000 4000

SCALE: FEET
SCALE IS APPROXIMATE

SOURCE:
USGS 7.5 MINUTE QUADRANGLE
WAUKEGAN, ILLINOIS 1960
PHOTOREVISED 1972 AND 1980

NOTE: This map excerpted from report previously prepared by SEC Donohue.

FIGURE 12-1.
HOSPITAL ROUTE MAP

CTO #0071
20611

NAVAL TRAINING CENTER
GREAT LAKES, ILLINOIS